United States Court of Appeals

for the Second Circuit

JOINT APPENDIX

B
Pls

76-4044

United States Court of Appeals
FOR THE SECOND CIRCUIT

No. 76-4044

BOC INTERNATIONAL LIMITED, f/k/a The British Oxygen Company Limited, BOC FINANCIAL CORPORATION, BOC HOLDINGS, LIMITED, and BRITISH OXYGEN INVESTMENTS, LIMITED,

Petitioners,

—against—

FEDERAL TRADE COMMISSION,

Respondent.

No. 76-4045

AIRCO, INC.,

Petitioner,

—against—

FEDERAL TRADE COMMISSION,

Respondent.

ON PETITIONS FOR REVIEW OF AN ORDER
OF THE FEDERAL TRADE COMMISSION

JOINT APPENDIX, VOLUME 8
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EXHIBITS

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BOC RX 199	Table of Unit Value—Shipments—Oxygen—1963-1972	A5217
BOC RX 200	Document consulted by Dr. Hedley-Whyte during direct examination	A5218
BOC RX 206	June 1, 1970 Report on visit to Carpenter Technology by Perham and Muller	A5219
BOC RX 208	U.S. Dept. of Commerce, *U.S. Industrial Outlook*, 1974	A5222
BOC RX 222	Sept. 29, 1972, R. C. Hesketh-Jones, Consultation BOC-Overseas Companies	A5224
BOC RX 223	July 21, 1972, R. C. Hesketh-Jones, Overseas Company Boards	A5227

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BOC RX 228	Program for the American Society of Anesthesiologists Annual Meeting, Oct.7-11, 1973	A5231
BOC RX 234	May 19, 1970 Letter from D. R. Harris to J. A. Perham	A5249
BOC RX 243	Percent Return on Total Invested Capital	A5250
BOC RX 244	Percent Return on Stockholders' Equity	A5251
BOC RX 246	Graphs of gas volume, quantity and unit price	A5252
BOC RX 260	Perry paper on oxygen and nitrogen (not in evidence)	A5265
BOC RX 261	American Iron & Steel Institute 1973 Report (not in evidence)	A5271

Exhibit Offered by Respondent Airco, Inc.

RAX 7	Airco Annual Report for 1973	A5274

Volume 10—In Camera Filings*

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* The Table of Contents for Volume 10 appears only in that volume.

A 4181

To: Members of Executive Committee 12 April 1973

CX-63-A

MEETING IN ST LOUIS 6 APRIL 1973

TO DISCUSS PROPOSED EMERSON ACQUISITION OF HARRIS CALORIFIC

Present :

Buck Persons - Chairman, Emerson Electric
Steve Taylor - Harris Calorific
Gus Young - Harris Calorific
Allan Perham - Canox
Peter Laister - BOC

BEST COPY AVAILABLE

Emerson have bid for Harris Calorific on the basis of a 2 for 1 share exchange contingent upon obtaining 90% plus of the stock. Taylor and Young both wish to accept.

With 9,825 Harris shares, this would value the total equity at $17,500,000, with the Emerson share standing at $95 as it was at the time of the bid. Currently the share price has fallen (as has, I believe, the Wall Street index).

Buck Persons was impressive as was their new Head Office, their clear cut corporate philosophy and the evidence of a firm and effective management that pervaded their systems and the people we met. Their product range is basically electrical, although it includes other items such as tools, and their policy is to find niches in the market place based upon specialisation. Then to promote these products whilst firmly maintaining a separate identity. They have made over thirty take-overs in the past five years and continued to maintain a better than 15% earnings and sales growth rate, and intend to keep this up.

The case I made was straightforward - we were not keen on selling our Harris interest but realised the necessity to do so to meet the 90% pool merger requirement. In return we expected to acquire the Harris Lake interest which we had been instrumental in developing in the first place and to which we were fairly closely tied with product interests. We also wished to retain an on-going interest in a welding relationship with Emerson/Harris.

After some discussion, during which it became clear that Persons was neutral on the issues but thought our requirement reasonable, he put the question in Steve Taylor's lap. Steve Taylor, after some discussion, came out in favour of our purchasing Harris Lake, although Gus Young was clearly quite strongly against it (it has a high growth rate and he likes the business !).

After a recess, during which Persons had consulted his lawyer, he told us that they could not meet our request because you cannot sell part of the business to an existing shareholder pre-event, within one year of a pool merger. I asked that we should buy it after the merger, and a further recess produced the legal information that they would not be able to sell for two years after a pool merger to a previous shareholder.

CX-63-B

I then asked that they give us a conditional agreement to purchase Harris Lake at the end of two years. A further recess brought the answer that, whilst such an agreement could not be made a condition of the pool merger, Buck Persons himself was willing to reach a private understanding about negotiations in two years time. I also got him to agree that negotiations on price would be substantially in the same area as would have applied today allowing for changes in the stock market, p/e etc.

Persons also said he had informed his Treasurer of his verbal commitment to us so that another officer of Emerson had the same understanding.

In summary, the understanding is "To discuss and negotiate the sale at the end of two years (without memorandum or written confirmation at this time) on the basis of the status of the Harris Lake business at that time. The price will be in the range of the p/e involved in the present total discussion as it then relates to the Dow Jones average compared with today".

Persons then asked if we intended to sell our Emerson stock acquired by the share exchange. I said that we were open minded but would not do so without informing him. He said that he would certainly like us to go back to Emerson if we were going to divest of Emerson, since they had excellent relations with the market and could place our block without upsetting the market price.

Separate discussions with Taylor and Young took place on the subject of George Lake's probable re-action to this proposal. They thought that he would sit tight for a while and then sell out, but they did not regard it as a great loss since there were potential candidates (also recruited from Forrester) on their staff. I made the point that if George Lake wanted to sell his 30%, then BOC would like to purchase it, if there was no legal objection to us so doing. It could well be that this interest would be small enough not to effect the pool merger and such a purchase would be in the spirit of our "after two years agreement". This possibility is to be left in the hands and at the discretion of Taylor and Young.

The understanding we have with them is clear enough, but I suspect that if Harris Lake continues to be successful, then we shall still have difficulty in getting Gus Young to consider a deal in two years time.

P. LAISTER

Copies to: Mr A. Perham, Canox
Mr N.F.J. Beckitt, Eton
Mr A.I.A. Ray, MH

Additional information being circulated:

Emerson Electric, Annual Report, 1972
Harris Calorific Consolidated Accounts, 1972
Brochure of Emerson presentation used by their PR people

Our File No.
Your File No.

A 4183

Date June 1 1973

om J.A. Perham, Toronto

CX-70-A

ubject HARRIS-LAKE

P. Laister, London

Dear Peter:

The Harris Calorific board meeting scheduled for May 25th was held May 31st which was my opportunity to discuss with Steve Taylor and Gus Young the possible acquisition by BOC of George Lake's 30% interest in Harris-Lake. I did not have time to explore the possible acquisition of all of Harris-Lake but will do so next week when Ralph Hopton and I meet with Tom Quintrell.

In the agreement between Lake and Harris if either party wishes to sell it must first offer to the other and Harris has the right to match any bona fide third party offer. If George Lake should resign Harris must buy his equity at book value. If Harris should fire Lake they must pay him book value plus 50%.

George Lake has consulted a lawyer in New York. He is trying to contend that the Harris/Emerson deal constitutes a sale of Harris-Lake by Harris Calorific and that therefore the Harris 70% must be offered to him. In a handwritten memo to Steve Taylor he has stated that if the advice given him by his lawyer does not stand up then there is no way he wants to work for a big company and he will want to sell. He asks what would Harris then offer.

Enclosed are some financial results for Harris-Lake. 1971 was the first full year as Harris-Lake. Sales as the Harris Medical Division were:

1968 - $500,000 1969 - $737,000 1970 - $804,000

with very small profits. The growth as Harris-Lake has been excellent. For four months 1973 sales are as budgeted but profit, although good, is somewhat less than budget. Shareholders' equity at April 30, 1973 was $422,736 giving Lake a book value for his 30% of $126,820.

...2

If Lake were to quit he would only be entitled to $126,820. Ironically, if he is fired he would be entitled to 50% more; i.e. $190,230. However, he is looking for more than this and probably the 17 times earnings as in the Emerson-Harris deal which works out to $282,200 based on 1972 audited results. Of course he will likely try to argue on 1973 results and contend he should get $514,300.

While we have told Emerson we are prepared to pay 17 times earnings, I have mentioned to Steve that is based on the assumption that George Lake would remain with the business and devote the same energy as before or two years in the future without George Lake and the net earnings at that time.

The difficulty in appraising the business in the present situation is the effect of George Lake's likely departure. 87% is sold through 108 distributors, several of whom have been attracted by George Lake to Harris-Lake. Excluding Ernie Savidge, they have 5 salesmen, of whom 3 were recruited by Lake. There are 16 employees. How many distributors, salesmen or employees might defect if George Lake went into competition with Harris-Lake since there is no no-competition clause in his agreement? How many might leave even if he does not set up in competition?

One formula suggested to me by Gus Young as used in buying distributors is book value plus three times current year's net profit. This works out to $217,580 based on April 30th book value and annualizing the current year's profit. Another thought was he might accept $100,000 more than he would receive from Harris (if fired); i.e. $190,230 + $100,000 = $290,230. Frankly, I think $300,000 is the highest we should go and that $250,000 is more realistic.

Obviously in the present situation Steve Taylor has a problem of continuing management he must resolve with Lake. Harris-Lake can't afford a half-hearted general manager. I think Lake is being foolish because he might well get much more if he energetically ran the business another two years or so. I was assured that he does not know of our verbal understanding with Persons.

I have suggested to Steve that he should tackle this problem right away. If Lake evidently will not give full effort, he should be given a reasonable period to find a bona-fide buyer or else be fired. If he finds a buyer, Steve will try to steer him to us and as a last resort has the right to match the price. If Lake approaches me I intend to try him at $225,000 to $250,000 but not higher than $300,000.

CX-70-C

While we agreed I should use my own judgment, I think you can see the unknowns in trying to evaluate this business. I would appreciate your comments - it really depends just how badly we want Harris-Lake.

Sincerely

JAP/G
encl.

cc - R.C. Hesketh-Jones
A.I. Ray
S.M. Taylor

A 4186 CONFIDENTIAL CX-72-A

'R' no. 157.
22. 6. 73.

157 - 1 Airco in the 'Fortune' 500

157 - 2 Background on USA Total Market (Oxygen & Nitrogen) (with Tables following)

157 - 3 Notes on USA Gases Environment, Special Reference to Airco.

157 - 4 Selected Points from our Airco Information Files

157 - 5 Airco's Sales Mix, and Comment.

$ 12 v. 1.20 -- 10% pa 1 Jan

A 4187 C157-I

Airco in the 'Fortune 500'

CX-72-B

(The 500 largest Industrials, Table., 'Fortune' for May 1973: data for 1972)

Airco ranked, by sales, 255th (262nd in previous year): sales $518 million.

By ten-year earnings per share growth (decline, in their case) Airco rank 451 in the 500. They rank 403 (~~previous year~~ ten-year average 425) by "Combined Return."

Net income shown as 0.4% of sales (rank 465) & 0.8% of stockholders equity (rank 462)

[APtoC, in contrast, a smaller firm (341 by sales, up from 356th previous year) are *92nd by "Combined Return", & with 8½% pa eps growth over 10 years rank 202]

[* but only 214 on 10-year average]

A 4188 CX-72-C

Airco's epd showing as :—

	$
1972	0.17 (restatement)
1971	1.64
1962	1.65

The 500 industrials together:

US total industrial sales, 75%

US employment.

"Combined Return" means the return to investors, including appreciation & cash payouts

Background on USA Total Market (Oxygen & Nitrogen)

An article in 'ECN', May 25th 1973, on "O_2, N_2 Markets in the US" begins :-

> "The value of shipments of oxygen in the US is $260m. annually at plant prices with growth over the past 10 years averaging approximately 7 per cent per year. Nitrogen adds another $150 m. per year with growth averaging 14 per cent per year".

(This article is from a paper by Romanelli of Olin Corporation).

Copies follow of the four tables in the article.

From Table 1 the following can be deduced:-

	USA total oxygen consumption other than for steel industry (Volume, cu. ft. x 10^9)
1956	30.0
1966	92.3
1971	106.7

Average rates of growth :-

Over 10 years 1956-66 : 12% pa

Over 5 years 1966-71 : 3% pa
(The slackening of the pace presumably reflects curtailment of space programmes)

22.6.73.

A 4190

Table 1

1000m ft³	Steel industry oxygen consump.	Total oxygen consumption	% oxygen consumption by steel industry
1958	180 (e)	480 (e)	37·5
1961	70·3	109·6	63·9
1966	160·8	253·1	63·5
1967	176·0	268·4	65·6
1968	181·7	280·9	64·0
1969	214·6	311·0	68·3
1970	219·6	319·3	63·8
1971	207·3	314·0 (e)	65·0

Table 2

	Oxygen & nitrogen unit value index
1961	100
1963	95
1965	88
1967	90
1969	85
1970	84
1971	82

Table 3
1972 markets for oxygen-nitrogen m ft³

	Oxygen		Nitrogen	
	Pipeline & captive	merchant	Pipeline & captive	merchant
Chemical process	57 000	2 800	33 200	18 500
Primary metals	225 300	22 700	7 600	7 600
Metal fabrication	15 000	27 200	15 000	14 000
Electronics	—	—	10 700	18 500
Low temperature process	—	—	—	11 000
Other	—	4 000	– 88 350	5 000
Shipments, SCF	300 300	56 700	94 650	74 600
% of shipments	57·0	10·8	18·0	14·2
% of revenues	32·	25·	10·	33·

Table 4
1972 markets for oxygen/nitrogen m ft³

	Oxygen		Nitrogen	
	Pipeline & captive	Merchant	Pipeline & captive	Merchant
Chemical process	76 400	3 750	52 700	23 400
Primary metals	257 000	32 000	5 100	10 200
Metal fabrication	16 000	35 400	17 500	20 000
Electronics	—	—	14 300	29 300
Low temperature process	—	—	—	26 800
Other	20 000	4 700	40 200	7 100
Shipments, SCF/year	369 400	75 850	134 200	122 800

Note: Total of the Table 3 figures (1972, cu.ft. x 10^9) is about 525. This seems close to a forecast in a survey by A D Little Dec. 1969, 565 for 1972 reflecting 10-12% pa growth 1968-72 (Little includes Argon, excludes low purity oxygen). Little's forecast total value, however, was 550 ($million, 1972) but say about 500 excluding Argon on a pro rata 1963 basis. The 1972 actual per Romanelli is $90 million below this - suggesting prices still weak, or "mix" appreciably different from Little forecast.

Little saw USA over-capacity for air separation products 1968 as 42%, and fall to 35-37% by end-1970. About 20% desirable for "... a reliable supply situation..."

Notes on USA Gases Environment, Special Reference to Airco

RCB: From notes of discussions in Oct. 1969 and Jan. 1970. Events in the succeeding 3½ years may have substantially affected some of these points.

1 Financial weakness of AIG (Airco Industrial Gases) attributed to unremunerative CO_2 contracts. Separate figures for atmospheric and fuel gases would show a better picture(A). But separately said (Simpson, B) that AIG in the red if the cylinder business excluded.

2 Muller in 1969 put AIG sales at ($million) 80-90 and assets at 130 - many of them obsolescent and over-valued. He thought AIG no. 2 in USA total gases market after UCL, but AP & C a close 3rd and perhaps poised to overtake (A).

C 3 AIG plant operating competence rated high, marketing less good with some key people having left under new regime (but Muller may have difficulty in taking a detached view on this). (A).

4 Distributors Post-1965 swing to use them more, cut down direct selling, probably a mistake if only because distributor is seldom keen to help customers to innovate with applications. The techniques in distribution (some computer-based) fast-changing; new faces. Many AIG cylinders sold to distributors, at above book values. (A).

Small users, including small cylinder users, buy through distributors - who buy from Airco's WPD who in turn buy from AIG. Price to a distributor, with AWPD margin, higher than equivalent-size direct customer's price with AIG - defended on service-content grounds. Distributors usually very highly geared; Airco occasionally helps with loans. Some suggestion that perhaps some distributors operate on fringes of the law in some ways, where the big Corporation has to behave impeccably. Also an employee-run (ie Corporation owned) distributorship lacks equity incentive; nevertheless there are a few such, for special reasons (B).

C

5 Supply Schemes, Steel Industry Airco came late into field, and then adopted low-bid ("at cost") philosophy to get liquid base-load for merchant markets. In 1969 about 50% of USA steel production was basic oxygen steel; then forecast to rise by 1975 to 80% or 90% (A).

Merchant liquid on back of tonnage is generally aggravating liquid over-capacity and price weakness (C, UC Linde).

6 Supply Schemes, New Processes Muller was optimistic on tonnage oxygen for hydro-cracking in oil refineries (A). (Subsequent events rather cast doubt?)

CX-72-6

7 Helium Airco's source via George Angle of Texas. Various comments suggesting potential dangers for Airco here (but apparently not supported by subsequent events). AIG no. 1 in the world in Helium, say 40% share. And an important part of the AIG total picture (A).

8 Ohio (A). "A significant proportion of total Airco O_2 requirements".

9 Glasier of Big Three, formerly 33 years with Airco rising to be head of AIG, said Airco's present style is to achieve maximum efficiency through fear as driving force for staff. He also attributed price weakness to Linde's immature attitude - hold market share at any cost, which the others follow (C. Glasier may find it hard to be unbiased).

Sources

A 8.10.69. Hammersmith. HSR with Al Muller; formerly Airco R & D chief, then on retainer to BOC.

B 21.1.70. IG field notes of his meeting at offices of Airco Welding Products, New York, 21.1.70; with Messrs Giordano and Gayley

C Jan. 1970 : IG field notes of other visits in the IG-JAP tour of U S A.

A 4193

(157 - 4)

CX-72-H

Selected Points from our Airco Information Files

i) Eugene Bell, then (Jan. '69) responsible for corporate diversification studies, subsequently moved to planning in AIG, quoted as saying that Spier Carbon the best diversification - although new competition from Japanese. Also favourable remarks on Pittsburgh Metallurgical Co. and on Ohio. (D)

ii) 90% of direct-account AIG ASU business done at "below schedule prices" on product manager's authorisation. Source outlines pricing formula and procedure (D).

iii) Airco has contractual arrangements to buy CO_2 from Vistron Corp., Lima, Ohio - a wholly owned subsidiary of Standard Oil of Ohio ("Search", Feb. 1971).
("Sohio" - BP associate or subsidiary?, possible further information source in London).

iv) AIG joint ventures for helium throughout EEC: L'AL and M-G. (Chem. and Eng. News, July 1971). Also with Nippon Sanso and others for Japan ("Search", Aug. 1971)

v) Airco borrow for supply schemes on 15-year notes. Airco and steel company signatures; no physical security. Rates such as to cover merchant-market liquefier etc. as well as the tonnage plant (BOC Internal Information Note, JMW, 2.3.70).

vi) Airco Singapore subsidiary established 1969 to produce electronic components; completion of plant in 1971 foreshadowed (International Commerce, July 1969; no subsequent information on file). *

vii) AIG's own CO_2 plant at Lawrence, Kansas, said to "... feature many innovations". Bulk distribution by road and rail ("Search", Aug. 1971).

viii) June 1972 Giordano (visiting Sweden for opening of new ferro-alloy furnace) said year's sales of Airco Inc. would exceed $500 million (Wall St. Journal).
NB In the event : $492 million reported (although 518 on 'Fortune' definition)

ix) At same ceremony, Dillon said Vargon (Sweden) some 20 - 25% of Airco world-wide alloys output. High pollution-control standards both in USA and Sweden, costs not borne by competitors elsewhere. Worries about EEC duties (but not quotas?); Norwegian competition to be unaffected. Furnace convertible to other alloys (Metal Bulletin, July 1972)

* but Annual Report for 1972 states plant enlarged.

x) CO_2 in the USA "... has moved back into a strong growth pattern".... after a "decade of stop and go's". All three forms of the product moving ahead. Chemetron say major factors are liquid for poultry/meats, and dry ice for airline meals. Airco mentioned, pellet system for airline food (C & EN, Oct. 1972)

xi) An AIG Vice-President-International appointed, office at Brussels (Cashman, ex-AP) (E, Sept. 1970).

xii) Chemicals and plastics businesses, sale to A P & C Inc.; $30 million in cash, of which $17 mn in first year, remainder over 8 years. (Chem. Age, Feb. 1971)

xiii) Airco Board authorising purchase of own Common Shares, up to 400,000 over 3-4 years (E, Dec. 1971).

xiv) Airco CO_2 plant, adjacent supplier Dow, at Terneuzen : 300 tpd, much of it for Belgian/French markets (CA, July 1972).

xv) New $7 million air separation plant at Albany, NY, for 1975 on-stream; 400 tpd gas, 200 tpd liquid. 1,400 tons liquid storage. (E, and Chemical Age, June 1973).

xvi) Airco active in oxygen waste-treatment process, industrial and municipal (Chem. and Eng. News, Jan. 1971)

Key

D C W Banyard, internal BOC memos Jan. 1969 following a visit to Airco's offices in New York.

E Moody's Industrials

(157-5)
(1)

CX-72-J

A-4195

	Sales ($ million)			Profits ($ million)			
	1970	'71	'72	1970A	'71A	'71B	'72B
Industrial gases & cryogenic equipment	117	121	240	10.0	12.5	21.1	26.8
Welding & cutting eqpt.	80	71		3.5	1.8		
Carbon, graphite, electronics & metals	70	77	81	3.6	5.2	8.0	7.2
Ferro-alloys & carbide	140	133 (104C)	128C	12.2	9.6	13.0C	3.9C
Medical gases & equipment	30	38	43	2.6	4.0	5.8	6.2
	437	441	492	31.9	33.1	47.9	44.1

As in 1972 Report

A: Before taxes
B: Before taxes, interest & corporate expenses
C: "Ferro-alloy"

A-4195
CX-72-J

(2)

CX-72-K

A 4196

	Sales 1972 ($ million)		Assume cc/sales (ratio)	Capital Employed $ million	Capital Employed $ million
Ind'l gases & cryogenic equipment	240 stated	(?) 170-160	1·1	187-176	Could be 230 (cc/sales ca. 1·6)
Welding & cutting eqpt.		?... 70-80	·4	28-32	38 (·5)
Ferro-alloys	128		1·0	128	162 (1·3)
All others (as above)	124		·6	74	94 (·8)
	492			417-420	total 520 → Prorate

but, in fact, we know

A-4196 CX-72-K

A 4197 CX-72-L

(Capital Employed as above) (from)		Available pre-tax profits, 1972, for profits (£ millions)		Return
230 but could be less	Grain & agric. equipt.	say 9	(On the way to the profits 12 in 1974, say 11 for grain only)	4%
38	Welding & cutting equipt	say 1	(cf 1.8 after interest & corporate expenses in 1971)	2½%
162	Food-allied	say nil	(earnings down sharply in Annual Report)	Nil
94 but could be much more	Other categories	27 (restricted)		29%
520		Total 37	Return	7%

(... I be

A 4198

CX-72-M (4)

Notes

(1) $230 million is hard to reconcile with Simpson's remarks GWH 4.9.72 to DWNP, PGB, AFK. He foreshadowed 1974 investment in AIG at $100 million with pre-tax profits $12 million.

(Adjusting CE/Sales for cryogenic equipment and then on to say 1 : 1 CE/Sales would leave substantial excess over $100 million, also explaining or "finding" where the CE thus lost from Gases has gone within the $520 million, eg if CE/Sales were 2.0 in ferro-alloys - remarkably high, too high to believe? - this would "find" about $90 million bringing us near to reconciliation).

(2) $37 million profits pre-tax, pre-interest on $520 million Capital Employed, 1972 actual, hypothetical/possible split thus :-

(37 on 520 : 7.1% return)

CX-72-N

A 4199

(5)

Alternative

Assume (Arbitrary assumption) — Garret + comp eqpt. RETURN 10% → $ million profits 23

Welding & milling eqpt. & ferro-alloys as above → 1

Other categories as residual → 13 (14% Return)

37

shall be less than this

EITHER garrett etc., as here, reasonably remunerative with 10% return on as above, & if timpren view also right (& straight), gain deferment & if medical & electronics (& other ideas) earn excellent return on investment

From H. S. RICH

A 4200

CX-75-A

Date: 27.6.73.

RESTRICTED

Mr P G Bosonnet
Mr L R Dingle
Mr J M Horner

[illegible]ed will be largely self-[illegible]natory, I think : at present [illegible]ge it exposes rather than at all [illegible]rmly answers certain questions [illegible] business mix, investment and [illegible]ofits.

H S R

A 4201

CX-75-B

RESTRICTED

27. 6. 73.

('R' no. 159)

AIRCO (8 tables)

The 1972 Annual Report, supplemented by the text of the Shareholders' Meeting, at first sight gives a wealth of information on the size and performance of the various businesses. Previous years' reports give a similar first impression.

Closer inspection reveals, however, that to some large extent it is a skilful exercise in concealment.

The tables that follow come from a quick exercise attempting to look behind the screen. Considerations of time and security have prevented any consultation with divisional personnel (eg comments of managers at Edmonton might be revealing on extent to which Airco Cryoplants is included in their capital, sales and profits figures); this can still be done if a deeper look is needed as a further step.

Some major questions remain unanswered; really we have only succeeded in exposing them at this stage.

Table

1 Sales and Profits as Reported

2 Sales; Comparison of Data

3 Sales, Including A Reconstruction

4 Sales, Further Reconstruction

5. Sales and Capital Employed

6 Profits, Capital Employed, Return

7 Profits and Returns in 'Gas and Gear'

8 Capital Employed and Profits - An Alternative Illustration

SALES AND PROFITS AS REPORTED

Table 1

- - - -As reported - - - - - -

		Sales (£ million)		Profits* (£ million)		Profits as % margin on sales		QUOTES FROM 1972 ANNUAL REPORT (AR) AND *AGM
		1971	1972	1971	1972	1971	1972	
1	Industrial gases and cryogenic equipment	121	-	-	-			The AIG div.... raised its income substantially to near all-time highs Sales of cryogenic equipment climbed 28% and earnings advanced sharply... new products. Airco WPD : 11% sales increase, all-time record sales and earnings (AR). ... earnings performance of Industrial Gases, WP and Electronics divisions was outstanding (AGM)
2	Welding & cutting equipment	71	-	-	-			
	(1 + 2 Sub total)	192	240	21.1	26.8	11.0	11.2	
3	Carbon, graphite, electronics and metals	77	81	8.0	7.2	10.4	8.9	
	Ferro-alloys (Ferro-alloys & carbide)	104 (133)	128	13.0	3.9	9.8	3.0	See Table 2
5	Medical gases & equipment	38	43	5.8	6.2	15.3	14.4	Sales... Ohio Med. Prods. Div..... another record year, almost doubled...in 5 years. Earnings at new high (AR)
	TOTAL	411	492	47.9	44.1	11.7	9.0	
	(Including carbide, as reported in 1971)	(441)						

*Before taxes, interest and corporate expense

*"Annual Meeting of Stockholders", 25th April 1973, report dated 28th May.

4202

SALES; COMPARISON OF DATA

Derived from The Statistical Table		The Narrative	
		Airco Alloys Div.	+ 17%
Ferro-alloys (a)	+ 23%	(b)	
		Airco-Speer Carbon-Graphite Div.	- 6%
Carbon, graphite, electronics & metals	+ 5%	Airco-Speer Electronics Div. ("near record high")	+ 39%
		Airco Temescal Div.	+ 14%
		Airco Vacuum Metals Div.	(c)
		Airco Viking Div. (d) ("..new..records..")	+ 8%

FIGURES RELATE TO SALES, 1972 on 1971

(a) Sales figures, $ million	1971	1972
1971 Annual Report "Ferro-alloys and carbide"	133	-
1972 Annual Report "Ferro-alloys"	104	128 (+23%)

Hence carbide 1971 deduced to be $29 million; this presumably excluding carbide sold within Airco to AIG and so hidden as an eventual sale within DA.

The 1972 report ("letter to Stock-Holders", p. 3) explains that carbide furnaces at Calvert City have been shut-down (plans for conversion to ferro-alloy production having been abandoned), but the "Louisville carbide facilities will continue to be operated to full present commitments...". In the more detailed narrative (p. 23), it is added that:

> "Early in 1973, the carbide segment of the former Airco Alloys & Carbide Division was established as a separate division (Airco Carbide).... will continue to produce...calcium carbide and acetylene..at... Louisville... will be phased out over the next several years"

CX-75-E

The classification in the 1972 statistics of any sales of carbide to outsiders is thus left obscure, but this may be a very small figure wherever it is hidden (AIG? - alongside acetylene).

(b) The products of Alloys Div. include (i) ferro-alloys (6 listed) and (ii) "manganese silicide, silicomanganese, stainless-steel pigs, special alloys". Since ferro-alloys showed a 23% increase but the division only 17%, the category 'ii' is presumably of some weight and showed little or no growth in revenue.

(c) Technical problems in Vacuum Metals are reported as having "penalised sales". This presumably means well below budget; but likely to have been above 1971 when the sales of this new project - it can be deduced from Annual Report for 1971 - were below 1, 500 tons of the special stainless-steel bar etc. products (say below $1 million)

(d) Forgings, extrusions etc. in titanium, stainless steels, copper alloys etc. for aerospace and other arduous applications stated to represent at end-1972 some 3% of Airco total assets. This, in problem-ridden 1972, might be no more than 1% of sales, say $5 million.

CX-73-1

A 4205

SALES, INCLUDING A RECONSTRUCTION

Table 3

	1972 sales stated in *Annual Report to be up on 1971 by	Sales, $ million S) Stated in Annual Report *** D) Deduced from combination of other figures in present table. E) Estimate - hypothesis			
		1971		1972	
i) Industrial gases (includes Airco Cryoplants**)	44%	E) 111-105	← D)	160-151	
ii) Cryogenic equipment	28%	E) 10-16	← D)	13-21	
i + ii, sub total	-			173-172	) This inconsistency) is unexplained****)
		S) 121	D) ↓	161	
iii Welding & cutting equipment	11%	S) 71	← D)	79	
TOTAL, i + ii + iii	-	S) 192		S) 240	

* In narrative section, 1972 report

** For 12 months 1972, apparently 3 months only 1971

***Statistical table ("... by product-line")

****A simultaneous equation shows that the inconsistency can only be explained straightforwardly if the 1971 sales split is ($ million) 36.5 for 'i' and 84.5 for 'ii'. This is inconceivable : explanation presumably lies in some dark terminological corner.

A 4206

SALES - FURTHER RECONSTRUCTIONS

Table 4

		1972 Sales Revenue Change on 1971 (Table 2)		*Possible (1971) weights, %		Calculations for average increases	
		Known	Assumed	'A'	'B'	'A'	'B'
i)	Some items from Airco Alloys Division		Nil	5	10	Nil	Nil
ii)	Airco-Speer Carbon-Graphite Div.	- 6%		30	50	-1.8	-3.0
iii)	Airco Speer Electronics Division	+39%		30	15	+11.7	+ 5.9
iv)	Airco Temescal Div.	+14%		15	5	+2.1	+ .7
v)	Airco Vacuum Metals Div.		Nil	5	5	Nil	Nil
vi)	Airco Viking Div.	+ 8%		15	15	+1.2	+ 1.2
Carbon, graphite, electronics & metals; total		+ 5%	-	**100	**100	+13.2	+ 4.8

*Hypothetical. Research to build up from a variety of sources could be undertaken, given time (and if security permits).

**100 = $77 million

BUT average is 5.0 known. Hence the 'A' mix cannot be right; the 'B' mix could possibly be about right.

CX-15-H

SALES AND CAPITAL EMPLOYED

Table 5

		Sales $ million 1972	Assume from BOC general background that ratio Capital Employed to sales could be:-	Indicates CE ($million)	Prorate to 520 total Estimates of Ca Employed, $ mil.
1	Industrial gases and cryogenic equipment	say 160 (a)	1.2	192	226 (CE/sales 1
2	Welding & cutting equip:	say 80 (a)	.5	40	47 (.6)
	(1 + 2, sub total)	240			
3	Carbon, graphite, electronics & metals	81	.6	49	57 (.7)
4	Ferro-alloys	128	1.0	128	150 (1.2)
5	Medical gases and equipment	43	.8	34	40 (.9)
	TOTAL	492		443 BUT we know the total is 520	520 (1.06)

a) Not disclosed by Airco (Remaining figures in this column, however, are as disclosed)

A4207

A 4208

CX-75-I

Table 6

PROFITS, CAPITAL EMPLOYED, RETURN

	Profits before taxes, interest & corporate expenses ($ million) 1972 (as stated in Statistical Table, Annual Report)	On basis before taxes & interest (but after corporate expense) the total figure is about 10% less. Assuming 10% evenly applicable across all the businesses, then:- (Profits, $ million)	Estimate of Capital Employed (Table 5) ($ million)	Hence return %
Industrial gases, cryogenic equipment, cutting & welding equipment	26.8	24.1	273	9
Carbon, graphite, electronics & metals	7.2	6.5	57	11
Ferro-alloys	3.9	3.5	150	2
Medical gases and equipment	6.2	5.6	40	14
	44.1	39.7	520	7½

A 4209 CX-75-J

Table 7

PROFITS AND RETURNS IN "GAS AND GEAR"

(1972)

	Estimate of Capital Employed ($ million)	Profits pre-tax, & interest ($ million)	Return
Industrial gases and cryogenic equipment (C)	226	20 - 19 (B)	8.8%-8.4%
Welding & cutting equipment	47	say 4 - 5 (A)	8.5%-10.5%
Sub-total	273	24	9%

(A) Had been 3.5 before taxes, probably 4.0 or more before taxes and interest, in 1970. The 1972 earnings stated to be a record.

(B) Obtained as residual

(C) Simpson, at discussion in London with DWNP and PGB, 4th Sept. 1972, reported to have expressed satisfaction with AIG results, foreshadowing "...profits by 1974 of $12 million before tax on investment of $100 million" (PGB's notes, 5.9.72). Airco total interest charge 1972 was $9.7 million; 1.85% of Capital Employed ($520 million). 1.85% of $226 million (above) gives $4.2 million; ie 20-19 would become 16 or 15 on post-interest basis. This is still far above the sort of 1972 figure Simpson's remarks would suggest, as is also the $226 Capital Employed - although if his remarks referred only to the equity element the unexplained gap on this side would become a lot smaller. Only a small part of the gaps could be explained by Cryoplants - included in the figures above but presumably excluded in his remarks. Inference must be either (i) he was at pains not to make AIG look too big and successful, or (ii) our estimates (above) doubtful - see next table.

A 4210

CX-75-K

Table 8

CAPITAL EMPLOYED AND PROFITS : AN ALTERNATIVE ILLUSTRATION

1972, $ million

	Capital Employed		Profits, pre-tax and interest	
	'A'	'B'	'A'	'B'
Industrial gases and cryogenic equipment	273	200	24	18
Ferro-alloys	150	say 180	3.5	3.5
All other categories	97	140	12	18.5 (C)
	520	520	39.7 say 40	40

'A' As above

'B' Top line arbitrarily adjusted to come somewhat nearer to the Simpson remark. Ferro-alloys : profits as before, Capital Employed an arbitrary 20% increase. "All other" as residual.

(C) gives 13% return, little changed from 'A'

A4211

CX-85-A

From: Company Secretary

To: Date:

Extract from BOC Board Meeting Minutes

[redacted]

6312 AIRCO FUTURE RELATIONS

Paper discussed at length. Main points :

i) The transaction would give rise to a substantial borrowing, probably repayable after 5 years either by Euro-dollar re-financing or by a rights issue at a time of BOC's own choosing.

ii) The present state of American Stock Market made this the right moment to buy.

iii) Airco were optimistic about their own future prospects despite poor recent performance. BOC, through past relationships, was aware of defects in management which would require to be remedied.

[redacted]

iv) More information to be sought on the prospects for disposing of certain Airco subsidiary activities and probable realisation figures. The Airco port folio contained some sub-units which were readily realisable and others which were not.

v) Proposal could be regarded as a departure from BOC's established policy of growth away from gas and gear with Europe as priority. On the other hand, the acquisition of Ohio Medical Products was entirely consistent with Medishield aspirations.

Noted that MDs and Director of Group Strategy were meeting Airco Directors in New York shortly. Approved continuation of discussions provided no commitment prior to further Board consideration. If necessary a special Board Meeting would be held in August.

6312 [redacted]

A4212

CX-85-B

Project "Blindfold"

1 Introduction

Airco Inc., formerly the Air Reduction Company, is among the three leading participants in the USA industrial gases and related businesses. Two events prompted study of an acquisition (i) Newcourt Securities, who have links with Rothschilds, made the point in discussion with Managing Director (MD) that the shares are now cheap, much below asset book value, having fallen more steeply than Wall Street as a whole; (ii) R V Giordano, President of Airco briefly visiting London, flew a kite with Chairman BOC about a possible "merger"; Airco's objective was defensive against possible takeover from an undesirable third party.

Consideration has been given to 100% acquisition, a merger, or to a minority investment in Airco. Because of the size of a 100% bid (£80 m.) it is considered beyond BOC's immediate capabilities. A merger is unattractive because of the wide differences in profitability and growth potential of the two companies. The acquisition of a large minority interest is attractive and agreement is sought to negotiate with Airco the acquisition by BOC of up to 49% of the equity at a price not exceeding £40 m.

2 Basic Facts and Figures

2a Size.

In the world "gas and gear" companies, Airco is one of the top (by turnover) 5 or 6 companies; 2nd or 3rd in USA. In the "Fortune" table of the 500 largest American industrial corporations it ranks 255th. Compared with BOC :-

	£ million	
	Airco	BOC
Sales	197	253
Capital employed	208	237
Profits before interest & tax (& as Return on CE)	15 (7%)	31 (13½%)
End-June 1973 Equity market valuation, approx.	55	150

2b Products

Airco's business mix for 1973 (partly estimated) was:-

£ million

	Sales	Capital Employed	Profits (& RoCE)
Industrial gases and cryogenic equipment	64*	90	7.4 (8%)
Welding & cutting equipment	32*	19	1.6 (8½%)
Carbon, graphite, electronics & metals	32	23	2.4 (10½%)
Ferro-alloys	52	60	1.2 (2%)
Medical gases & equipment	17*	16	2.4 (15%)
	197	208	15 (7%)

*Total of these three is 113, 58% of total sales. BOC's traditional gas and gas-related products are approximately 70% of Group turnover.

The product-ranges closely resemble BOC's in the areas marked above with an asterisk. The others are mainly unfamiliar to BOC. The ferro-alloys are at a different end of the market from BOC's ferro-alloys; BOC higher value, lower volume.

2c Market Position

Generally, in the USA gases businesses, Airco is 3rd, behind Air Products and Union Carbide. In CO_2, Airco are probably 1st= with Chemetron. In Helium they hold a world-wide position of leadership.

Gases are to a considerable extent sold through distributors : at one time Airco followed a policy of selling assets - cylinders, evaporators etc. - to its distributors.

The market position is supported by considerable effort in product applications developments, eg CO_2 in the food industry. Total R & D spending in 1972 was £3 million; against BOC £2.6 million.

2d Financial Position

The record is weak; eg in "Fortune's" recent "500" table Airco ranked 425 on the ten-year Combined Return rating - which means price appreciation plus cash pay-outs. The 1972 earnings per share, declared as $1.53 on a "continuing operations" basis, compares with ($):-

1962	1.65
1968	1.62
69	1.65
70	1.50
71	1.57

If extraordinary items are charged, the 1972 figure is 17 cents only.

Book value of stock-holders' equity is some £105 million, £22.3 per share; thus the current market value of about £11 represents 50% discount.

Poor results in 1972 were due to misfortune in ferro-alloys and carbide - indeed 40 cents per share is said to be the measure of the ferro-alloys set-back. The industrial gases and welding products profits improved by 30% after four years of static results in what has been a difficult environment, with over-capacity and bitter price competition. The Ohio Medical Products division, which occupies a position of strength in the USA markets for medical gases and equipment, seems to have shown an acceptable financial performance in 1971 and 1972.

Gearing at 38% is rather high by American standards; in addition plant is financed off the balance sheet. Airco can properly use commercial arguments much the same as BOC's in favour of high gearing.

On balance, Airco is a highly capital intensive company - Capital Employed exceeds sales; Capital Employed per head equivalent to £16,000. Capital Expenditure in 1972 was some £16 million; against £13 million in 1971.

2e Employees Total number end-1972 13,000 (BOC Group 40,000).

	Sales per head, 1972. £
Airco	15,000
BOC, UK	8,700
BOC, Group	6,250

A partial explanation of the difference may lie in the fact that the more labour-intensive end of the operation, in distribution, is often in distributors' hands in the USA.

2f Board Both George S Dillon, age 55, (Chairman of the Board and Chief Executive Officer) and Richard V Giordano, age 39, (President and Chief Operating Officer) are well known to BOC's executive directors; so, too, is David J Craig, age 47, one of three "Group Vice Presidents". These three are considered to be the most influential of the Airco management and their view would be critical in any acquisition negotiations.

2g 'Style' Both Dillon and Giordano are closely associated with a major law firm, which for many years has had close links with Airco. At one time, it is thought, this firm was trustee for large inherited personal fortunes which were invested in Airco - and the attitudes were defensive, ie to

preserve rather than to enlarge the inheritance. The conventional and more ambitious objectives of the typical large industrial firm seem to have prevailed in more recent years, but some remnants of the former attitudes may survive.

A 4215

2h International Scope This is first and foremost a USA corporation; over 90% of its activities are in the home market. Operations and arrangements elsewhere include: helium distribution in Europe, Japan and elsewhere; ferro-alloys manufacture in Sweden; electronic components manufactured in low-labour costs areas (Mexico and Singapore); a small gas operation in Chile.

3 BOC's Strategic Arguments

For BOC a move on Airco would be a major strategic event, and although prompted by the immediate opportunity situation it would require to be fully justified as an act of strategy. Main points:-

PRO

i) It would create indisputably the world no. 1 force in "gas and gear" - sales £340 million, with L'Air Liquide in second place, £220 million (1971 figures). Not that a great many tangible economies of integration are to be achieved, rather a matter of international "muscle" commercially and technologically. More specifically it would give us more credibility opposite Air Products and L'Air Liquide and the ability to respond to their challenges in markets which are important to them. The strong Airco position in CO_2 would provide know-how to support BOC Group ambitions in CO_2, with the food industry as a major area served.

ii) An investment on attractive terms. Even a large premium on today's equity market value would still leave substantial discount on asset values. There are a number of the constituent businesses that BOC would wish to see sold and part of any investment approach would depend on the local management's willingness to support BOC suggestions in this area. The Ferro-Alloys is one obvious candidate in this area. Given skilful packaging and marketing, the net cost of the businesses to be retained should be low by any standards.

iii) It would go far to satisfy, overnight as it were, the BOC aspirations for a more widely international business status. Despite many current problems, the USA presents and is likely to continue to present a challenging and rewarding environment for technology and enterprise. Despite faster growth in Europe and especially Japan, Gross National Product in 1980 is forecast to be the world's largest :-

	GNP 1976 (in $\$ \times 10^9$, at 1975 prices)
USA	600
EEC (the Nine)	465
Japan	220 - 300
USSR	275

iv) The Ohio medical business could provide, at one stroke, the vehicle that Medishield require to establish themselves in the US market. The area of operation is similar to BOC but the markets are distant. Floated as a separate activity Ohio has a potential market value equal to 50% of Airco's current market capitalisation.

v) Because of anti-trust legislation a competitive approach from other US gas companies or L'Air Liquide would be banned. BOC would be in an advantageous position to bid.

CON

vi) Not easily reconcilable with established aspirations to move into areas of faster growth potential than "gas and gear". JMW

vii) Not easily reconcilable with the expressed first priority for Europe in the greater internationalisation of the Group's activities, with the USA to be at best second equal with Japan. This objective was influenced by the apparent lack of opportunities in the USA. JMW

viii) Demands on management resources and consequential pre-empting, or deferring, of other expansive BOC businesses.

ix) The various hazards necessarily resulting from a move of this magnitude which could prejudice the future prospects of BOC. These are considered later. We have some USA market statistics and can to some extent re-construct market-share statistics; in fact, however, USA markets are vast and heterogeneous - we know little about particular participants' strengths and weaknesses by geographical and other segments; we know that it is a very varied pattern. It is encouraging that even in the difficult environment of the recent past, skilful managements earned acceptable returns, eg (from "Fortune", 10 years to 1972) :-

A 4217

	"Combined return"	eps growth %
Air Products & Chemicals Inc.	Rank 92nd in the 500	8½
Big Three Industries	Rank 89th in "the 2nd 500"	18

There is some evidence of firmer pricing and profitability plateau for the middle/later 1970s in the USA gases businesses.

4 Hazards

The main hazard is that a BOC 49% move might provoke, from outside the gases industry, a bid for 100%. If successful, and if the new owner is a highly competent manager, BOC would have precipitated the creation of a new force in the gases industry. It is this rather than the mere fact of rebuff or defeat which is the risk : memories are usually short after a rebuff and image recovers. While the risk is not to be wholly dismissed, it is suggested that it is not serious enough to deter BOC.

A counter-bid from within the gases industry is very unlikely. An American expert, introduced by Lazards, gives the opinion that anti-trust proceedings would debar any move by existing American participants of any significant size. It is also his opinion that a BOC move on Airco would not be subject to anti-trust proceedings.

There are a number of other risks; probably the most serious are that (a) Airco recovery potential turns out to be limited, or achievable only at excessive cost in management and money; or (b) that the new Airco Board, with BOC strongly represented, would not agree on the main lines of rationalisation, integration and divestment policies for the various Airco businesses. The safeguard against both will lie in the preliminaries between BOC and Airco : trading information would be requested, including the main features of the corporate plan, and clear understanding on major policy issues sought.

There are some other conceivable risks, but remoteenough to be ignored : eg at some future stage a powerful bidder seeking to enter the industry might be more attracted by BOC and Airco as allies than if they were separate.

5 Business Plans

Assuming a 49% deal done, and BOC exerting a strong influence in Airco's counsels, BOC policy preferences would run along two lines :-

In gases, welding products, cryogenic equipment and medical : there are the advantages of combination with BOC, and there is BOC's familiarity with the businesses.

In the remaining basic areas, BOC has no particular position of strength - nor are there BOC ambitions to be furthered.

A 4218

Divestment, for cash, preferably on an optimised basis and therefore deferred in some cases, is indicated throughout the second category, unless there are strong profit and market attractions in some of the smaller activities.

BOC's Eventual Objectives

BOC objectives towards the Airco activities would be :-

In Gases : the present recovery to be taken a good deal further, with some injection of BOC management - although keeping a careful eye on the many differences in commercial and cultural environment. Collaboration and rationalisation of the new applications and development efforts would be fostered. Make-versus-buy on cryogenic equipment would be reviewed, item by item. International mutual aid, especially with Canox but also more widely involving CIG and others, to be developed on operations and commercial practices. BOC managerial influence seen as important from the start; BOC in their Gases activities are probably more successful than Airco.

In Welding Products : BOC managerial influence desirable. Technical and some operational collaboration, particularly to rationalise the development efforts and to provide launch-pad for "Interweld" type moves into, eg. Latin American countries. Airco's welding products activities are probably managed as well if not better than BOC's.

In Medical there is the concept of Ohio amalgamated into Medishield; the new entity thus created could obtain its own USA stock-market quotation enabling it to use its own paper as vehicle for further acquisitions. Product-development, manufacturing and marketing would all be re-evolved within the context of the widened Medishield and its international objectives.

In general the remaining business, in round figures some £80 million both in turnover and Capital Employed (book value), would be for disposal within about two years:-

Ferro-alloys: Divestment possibly in package with some of Metals Division's interests, if some measure of divestment there appears to be the correct policy.

Carbon, graphite, metals, electronics: again, a policy of divestment is likely to be preferred; with few exceptions.

7 Possible Schemes: Acquisition or Merger

Airco are willing for a merger: quick consummation likely if we agree. This would enable us quickly to develop the ambitions of Medishield now including Ohio; also the other international advantages in gas and welding products as discussed above. It would avoid the obstacles - financial, legal and managerial - likely to face us if we pursue an acquisition.

However there seems to be an over-shadowing argument against a true merger: for BOC at the present stage of its history it is not a necessary or in any way desirable step to enter any scheme involving loss or dilution of independence. Airco's incentive for a merger is based on the need to protect themselves against an unwelcome bid. A merger would raise problems of who is the master and although pre-merger intentions may be clear the problems of getting agreed decisions implemented would be difficult. Then there are valuation and structuring problems. Airco would probably want to value on assets, or a combination of assets and expected profits (they see their profits rising steeply). Our interest in Airco is partly based on their low current market valuation. Agreement on satisfactory terms is unlikely. For BOC an acquisition is better than merger although it may be that the outward or temporary appearance of a "merger" would be necessary in a workable scheme. A continuing outward identity for Airco, and continuity for a few top managerial figures, might be features. But effective managerial control for BOC - even if in some ways qualified or deferred in some parts of the business - seems very desirable.

Broadly, there are three sorts of scheme:-

i) BOC to acquire 100% of Airco shares

ii) BOC goes for a majority - say 51% or 66%

iii) BOC accepts a minority position

The preferred alternative is the bid for 100%. In such a situation the chance of a competitive bid is reduced; BOC management would be in control to overcome resistance by Airco management to rationalisation plans; the restructuring would not be affected by the need to satisfy the interests of minority shareholders. Such freedom is desirable, especially in the US situation. The short-term investment is higher but would be reduced to manageable levels by sale of activities, hiving off part of Ohio, and possibly

refloating the traditional gas and gear business with BOC retaining say 60% interest.

A 4220

However : the 100% bid route has not proved feasible because of the size of the acquisition. 100% would probably cost BOC £80 million. In addition BOC would take over Airco debt of £80 million. This £160 million borrowing on top of the current BOC borrowings of £110 million would require an early rights issue of at least £40 million. A paper offer is not considered practical for an American corporation. There are also short-term limitations in our borrowing capacity that makes an outright cash bid unacceptable.

An alternative would be for BOC to find a financial partner who would acquire 51% of Airco with BOC purchasing 49% but having the option to obtain contol in say 5 years. This possibility is being explored but would depend on finding the partner who would be willing to invest substantially and allow BOC to manage the activity.

Acquisition of a simple majority overcomes some of the control problems, but has serious disadvantage on BOC's borrowing capabilities. If Airco is a subsidiary of BOC then the whole of Airco's borrowings come out of BOC Group facilities. Control could not be achieved without changes in BOC's Articles of Association and in the terms of our tonnage Debenture Deed.

The only viable alternative currently available is to seek a minority interest. At a 50% premium over market price the cost would be £40 million for a 49% interest. As an associate 49% of Airco's profits would be consolidated into BOC's accounts but the Airco borrowing would not appear in the BOC balance sheet. A £40 million acquisition is within the present borrowing capacity of the Group.

The disadvantage at 49% is that it leaves us short of total control of Airco management, and to pursue the changes in operation considered necessary. Taking a minority interest would depend on the understandings that could be reached with the existing Airco management about future policies. If after discussion with Dillon, Giordano and Craig agreement can be reached on Airco's future development, a minority interest could stop Airco going to another bidder and provide a base for obtaining control at some future date. The actual % obtained in Airco may be less than 49% - although a lower figure would have to be such that there was no risk of another party obtaining control without BOC agreement.

8 Financial Position

The current share price of Airco is $10\frac{7}{8}$ compared with a 1972/3 high of $23\frac{3}{4}$ and an all-time high of $44\frac{7}{8}$ (in 1967). Assuming purchase of a 49% interest at £17.50 per share - this would represent 7.5 times 1972 earnings on the actual tax charge or 15 times on a 50% tax charge. At this price the cost to BOC would be £40 million.

BEST COPY AVAILABLE

BOC would account for a 49% interest in Airco under the UK Associate Company accounting standard.

Taking Airco's 1972 accounts as a base, the BOC Balance Sheet would show:-

Cost of Investment	£40 million
Funded by Debt	" "

In succeeding years investment cost would be increased by BOC's pro-rata share of Airco retention. Airco's debt is not consolidated.

The BOC P & L position would be :-

	£'000	
Pre-tax profits (49% thereof)	5,186	
Corporation Tax	2,593	
Addition to BOC post tax profits	2,593	
Withholding tax at 15% dividend of £1.795 million ($0.88 per share)	269	£1
Net addition to earnings ex Airco	2,324	
		Equivalent Return pre-interest and tax on a UK investment of £40 mill:
Interest on £40 million @ 5% net (after 50% tax relief in tax charge terms)	2,000	
Total net addition to BOC's earnings	324	11.6%
" " " if witholding tax can be avoided	593	13.0%

The additional interest of £4 million gross per year will result in BOC not paying any normal UK corporation tax, apart from ACT on BOC dividends in the years 1974 and 1975. The position continues on a reduced scale until 1980. There is therefore an unfavourable cash flow position which means an additional claim on BOC resources over the next 5 years of up to £23 million. £12 M This rapidly corrects itself after 1978 and earlier if there are adequate profits against which tax relief on the interest costs can be claimed. Possible measures to solve this problem are being studied.

The EPS situation is favourable. A £250,000 improvement in earnings, after allowing for an adverse tax relief situation in the UK, would increase expected 1974 EPS by about 2%.

If there is no increase in Airco's profits over the next 5 years - a most pessimistic view - the net effect would be to marginally dilute BOC's EPS until there are sufficient UK profits to recover full tax credit. The dilution problem could be overcome with a relatively small growth in Airco profit.

Airco themselves have expressed a view that profits could shortly recover to about $2 per share against the current $1.52 level. If this happened the effect would be to increase BOC's EPS by:-

11% related to BOC's projected 1974 level

4% - 5% related to BOC's projected 1978 level, ie an average EPS growth rate of (say) 10% pa from 1973 to 1978 would be levered up to 11%

Although in the long term an acquisition of this size will probably require some increase in BOC's equity base, a rights issue in the next few years is not necessary unless other BOC investment plans require significant funds beyond those allowed for in the 5 years strategy. The immediate effect of £40 million on gearing of BOC would be to raise it to 53% approximately. The gearing and financing position may change if after acquisition of 49% it was later found to be desirable and possible to obtain total control.

It is against the foregoing that the request to pursue negotiations on the basis of acquiring a minority is based. Agreement to negotiate would be followed by discussions with Airco on the basis of which the final decision to proceed would depend.

(An Appendix consisting of copies of source data on Airco is being issued separately)

A 4223

Appendix to paper dated [illegible]
Project Planning [illegible]
63

This Appendix, as additional background consists of selected extracts from:-

The company's Annual Report to the Securities and Exchange Commission.

Front page

pp 1 - 6

p. 13 (Balance Sheet)

and from:-

Report to Stockholders (May 28, 1973) : also includes first quarter results 1973.

pp. 3 - 7 : Chairman's Report (as previously given : Annual Meeting)

p. 8 : First Quarter 1973.

A 4224 SX-85-N RESTRICTED

Appendix to paper dated July on Project "Bimetoja"

63

This Appendix, as additional background, consists of selected extracts from:-

The company's Annual Report to the Securities and Exchange Commission.

Front page

pp 1 - 6

p. 13 (Balance Sheet)

and from:-

Report to Stockholders (May 28, 1973) : also includes first quarter results 1973.

pp. 3 - 7 : Chairman's report (as previously given at Annual Meeting)

p. 8 : First Quarter 1973.

A 4225 CX-85-0

1-111

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

MAR 30 1973

DIVISION OF CORPORATION FINANCE

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 1972 — Commission file number 1-111

Airco, Inc.

(Exact name of registrant as specified in its charter)

New York	13-1600979
(State or other jurisdiction of incorporation or organization)	(I. R. S. Employer Identification No.)
85 Chestnut Ridge Road, Montvale, New Jersey	07645
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (201) 573-0300

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, $1.00 par value	New York Stock Exchange
3¾% Convertible Subordinated Debentures due August 15, 1987	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

Not Applicable
(Title of class)

Indicate by check mark whether the registrant (1) has filed all annual, quarterly and other reports required to be filed with the Commission and (2) has been subject to the filing requirements for at least the past 90 days. Yes ✓ No .....

PART I

Item 1. (a) Business.

Airco, Inc., herein referred to as the Company, carries on its business principally through operating divisions in the United States. In addition, the Company manufactures and sells its products through two subsidiaries in Canada, one subsidiary in Mexico, and overseas subsidiaries in Belgium, France, the Federal Republic of Germany, the Netherlands, the United Kingdom, Singapore, Sweden and Switzerland, as well as through a joint venture in Japan.

The Company's lines of business during 1972 were: Industrial Gases and Cryogenic, Welding and Cutting Equipment; Ferroalloys; Carbon-Graphite, Electronics and Metals; Medical Gases and Equipment. (Note: On January 24, 1973, the Company announced the discontinuance of the Carbide-Acetylene business. A description of this business is set forth below under the title "Carbide-Acetylene—Discontinued Operations".)

Industrial Gases and Cryogenic, Welding and Cutting Equipment

The Company's industrial gases are used primarily as follows: oxygen in the manufacture of steel and petrochemicals, in chemical processes, and in oxyacetylene processes; acetylene in oxyacetylene processes; MAPP Gas (purchased from others) in cutting and metal-joining processes; nitrogen in various processes in the chemical, electronic, petroleum and aircraft industries, metal and food processing, food preservation, and in low temperature testing of missile components; argon as an inert atmosphere in metal processing and in inert gas-shielded electric arcwelding; hydrogen in the fabrication of electronic components in metal treating, in low temperature applications, and as a rocket propellant; helium (purchased from others) in inert gas-shielded electric arcwelding processes, in inerting of electronic and metal fabrication processes, in lifting applications, in carrier gas uses for instrumentation, and for extremely low temperature applications; rare gases for electronic tubes, tubular display lights, high intensity and incandescent light sources, and in physics experiments; specialty gases in the production of semiconductors and in the calibration of equipment used by the chemical and pollution-control industries.

Carbon dioxide is sold in gaseous, liquid and solid ("Dry Ice" blocks and pellets) form primarily for use in the carbonation of beverages, food processing and preservation, refrigeration and in connection with various chemical processes. Carbon dioxide is also used in gas-shielded electric arcwelding processes, trimming of molded rubber products and low temperature testing of missile components.

The Company's industrial gases are delivered to customers as compressed gas or liquefied product in cylinders, tube trailers, liquid tank trailers and rail cars pursuant to sales agreements or purchase orders, and as compressed gas via pipeline under long-term supply contracts. In addition to direct sales, the Company markets its industrial gases through a domestic network of several hundred independent distributors and nineteen company-owned Sales & Service Centers. The Company is in the process of closing down its wholly-owned subsidiary N. V. Airco Continental S. A. at Antwerp, Belgium. The major portion of the industrial gases business transacted by N. V. Airco Continental S. A. was in the sale of Helium. These sales are now being handled through agreements with L'Air Liquide at its transfilling facility in Paris, France and with Messer Griesheim G.m.b.H. at its transfilling facility in Antwerp, Belgium. The Company has a 43% ownership in a joint venture (major owner is Nippon Sanso K.K.) in Tokyo, Japan for the sale and distribution of Helium in the Far East.

The Company sells a broad line of cryogenic equipment for the processing, storage, handling and delivery of liquefied gases. Principal products are high pressure pumps, centrifugal pumps, submerged-motor pumps, centrifugal compressors, turboexpanders, high performance motors and alternators, closed cycle refrigerators, food freezing equipment, carbon dioxide pellet machines, and a variety of sophisticated equipment for use in cryogenic research and commercial applications. Primary markets for this cryogenic equipment are the industrial gases, liquefied natural gas, petro-chemical, aerospace, airlines and food industries.

At the end of September 1971, the Company terminated its joint venture with the British Oxygen Company, Limited, which had been concerned with the manufacture and sale of large cryogenic plants and related equipment on a worldwide basis. The United States based portion of the venture is now operated as a wholly-owned subsidiary of the Company under the name Airco Cryoplants Corporation. This subsidiary markets, designs and constructs air separation plants, carbon dioxide liquefaction plants, liquid natural gas peak shaving plants, nuclear decontamination systems and nitrogen generators throughout the United States.

The Company offers a wide range of oxyacetylene and other fuel gas cutting and welding apparatus, machines and accessories; electric arcwelding apparatus, machines and accessories; welding positioners, [illegible] welding electrodes; and a variety of arcwelding accessories and safety equipment. The metal arcwelding electrodes, welding wires, safety equipment, and a substantial

portion of the apparatus, machines and accessories are manufactured by the Company. The balance of these items are purchased from a number of independent suppliers.

Principal industrial markets for the Company's welding and cutting equipment are machinery and appliances, railroad and shipbuilding, metal fabricating, automotive, iron and steel, electrical equipment and electronics, and aircraft and aerospace. In addition to direct sales to industry, the Company sells and distributes its welding and cutting equipment through several hundred independent domestic distributors and nineteen company-owned Sales & Service Centers.

Ferroalloys

The Company's ferroalloy products are concentrated in three principal alloy groups: chrome, silicon and manganese. In addition, the Company is a supplier of remelt stainless grindings.

The most extensive use of chromium alloys and stainless remelt products is in stainless steels, which in turn are used in automotive applications, construction, aircraft, specialized industrial equipment, farm and food processing equipment, home kitchen equipment and furniture and chemical processing equipment. Chromium alloys are also used in alloy steels for high temperature service in a variety of products including jet engines and gas turbines.

Silicon alloys are used in the production of electrical steels which are utilized in many types of electrical apparatus. In addition, silicon metal is used in the aluminum industry in the production of aluminum alloys.

Silico manganese, an alloy of manganese and silicon, is used by the steel industry in both open hearth and electric furnaces as a deoxidizer, as well as for manganese additions. Standard ferromanganese has similar applications and is also used as a cleansing agent.

In addition to domestic operations, substantial quantities of ferroalloys are manufactured and sold by the Company's wholly-owned Swedish Subsidiary, Airco Alloys AB.

Carbon-Graphite, Electronics and Metals

The Company's principal carbon products include brushes for electric motors and generators that are widely used in the transportation and electrical appliance industries, welding and gouging rods for steel foundry and fabricating operations, carbon battery electrodes for use in the manufacture of dry cell batteries, and a broad variety of precision fixtures, molds and machined specialties for use in the metallurgical, electrical and electronic industries.

Graphite products include threaded electrodes for use in electric arc furnaces in the production of steel, anodes for the electrolytic production of chlorine, caustic soda, magnesium and sodium, crucibles for melting specialty metals and quartz, and molds for casting refractories and non-ferrous metals.

Carbon-graphite products are marketed domestically and in Canada primarily through full time sales personnel. Overseas markets are served both through the Company's sales offices and through commercial export firms.

During 1972 the Company manufactured and sold a variety of electronic components consisting of fixed composition resistors, coils and capacitors. The principal markets for electronic components are the producers of radio and television sets, computers, data processing equipment, industrial electronic apparatus, and military and aerospace electronic equipment. The Company's electronic components are sold directly to original equipment manufacturers, and in smaller quantities through independent distributors.

In recent years, foreign-made fixed resistors, coils and capacitors have exerted significant competitive pressure on the sale of domestically manufactured components. In response to this competitive pressure, the Company removed most of its manufacturing operations for fixed resistors and coils to new plant facilities in, respectively, Singapore and Mexico.

The Company's metals products include three principal groups: electron-beam hearth refined steels; ring components and forgings; and high-vacuum electron-beam production process equipment.

Stainless and specialty steels produced by the Company's electron-beam hearth refining process are manufactured in ingot and slab form and then converted for Airco by domestic steel producers into finished products such as sheet, strip, bar, billet, and wire, as well as skelp suitable for pipe and tube production. The chemical process, petroleum refining, pulp and paper, power, desalination and water treatment, shipbuilding, and food processing industries are considered as potential markets for these products. The products are beginning to find acceptance in these markets and it is expected that losses experienced in 1972 and prior years will be reduced in 1973 if the significantly higher sales volume presently programmed is attained. Investment in facilities and inventories for this product group was 3%

of the Company's total assets at the close of 1972. The Company is presently the only domestic producer of electron-beam refined ferritic (non nickel bearing) stainless steels.

In addition to general industrial forgings, the Company manufactures and sells seamless roll forged rings, press and hammer forgings, extrusions, crane mill parts, and custom rolled bar. Such products are produced from a variety of metals, including titanium, nickel base and refractory alloys, stainless steels, aluminum, alloy steels and copper alloys. Principal uses are in the gas turbine, aerospace, machinery, nuclear, electronics, and petrochemical industries.

High-vacuum electron-beam equipment is used in various production processes and experimental applications, including the continuous heating of strip and slabs of metals, the deposition of coatings on glass, metals, plastics and paper, the application of protective coatings on jet-engine turbine blades and vanes, and the deposition of electronic circuits on various substrates. The melting, purification, alloying, casting and finishing of steels and refractory metals is also accomplished by this process. In addition to electron-beam processing systems, the Company manufactures a standard line of electron-beam guns and power supplies, transformers, high-vacuum valves and pumps, vacuum induction furnaces, and related monitoring equipment.

Principal markets for electron-beam equipment are the steel, alloys, electronics, optical, aircraft and glass industries. The Company sells electron-beam equipment domestically through its own field sales personnel, in Europe through a wholly-owned Dutch subsidiary, and in the Far East through a Japanese trading company.

Medical Gases and Equipment

The Company produces and sells a wide range of anesthetic, analgesic and therapeutic gases, including oxygen, nitrous oxide, cyclopropane and various medical gas mixtures. The Company also sells a variety of medical equipment relating to life support systems in the surgical environment and for patients having thermal, respiratory and cardiovascular deficiencies in the general medical environment, including anesthesia apparatus, oxygen therapy and resuscitation equipment, respirators, intermittent positive pressure breathing apparatus, hospital pipeline systems, infant incubators, pulmonary diagnostic equipment and cryosurgical devices. All of the medical gases and most of the medical equipment sold by the Company are produced in the Company's own manufacturing facilities.

Principal markets for the Company's medical gases and equipment are hospitals, clinics and nursing homes, and the medical and dental professions. Domestic sales and distribution of these products are accomplished both on a direct basis and through independent distributors. Foreign sales are handled primarily through sales agencies and independent distributors.

Carbide-Acetylene—Discontinued Operations

On January 24, 1973, the Company announced the discontinuance of its Carbide-Acetylene business. The Company produced calcium carbide for the generation of acetylene for both chemical and industrial use at two plants located in Calvert City and Louisville, Kentucky. Calcium carbide production at Calvert City, Kentucky has been discontinued and production at Louisville will be phased out over the next several years.

(b) Business—General Information

(1) *Competitive Conditions*

The Company estimates that it is one of the major domestic producers of oxygen, acetylene, nitrogen, argon, rare gases, welding and cutting equipment, carbon and graphite products, certain ferroalloys, carbon dioxide, high-vacuum electron-beam equipment and medical gases and related equipment. All fields in which the Company operates are highly competitive.

(2) *Backlog of Orders*

Order backlog, which is not a significant factor in the business of the Company as a whole, approximated $39,000,000 at December 31, 1972 (the major portion of which will be filled in 1973) and $54,000,000 at December 31, 1971, applicable principally to the Industrial Gases and Cryogenic, Welding and Cutting Equipment line of business.

(3) *Raw Materials*

The Company's raw materials are obtained from numerous sources, both foreign and domestic. No one source is considered essential to the business of the Company as a whole.

(4) *Patents and Licenses*

The Company owns or is licensed under numerous patents. No one patent or group of patents, however, is considered essential to the business of the Company as a whole.

(5) *Research and Development*

The Company carries on research and development in various fields corresponding to businesses in which it is engaged. The Central Research Laboratories at Murray Hill, New Jersey, are primarily concerned with long-range technical activities. Major divisional research and engineering installations, primarily concerned with technical activities applied to commercial operations, are located at Niagara Falls, New York; Union, New Jersey; and Madison, Wisconsin. In addition, ten smaller development laboratories are located at various plants throughout the country. In 1972, the Company spent approximately $6,700,000 and employed approximately 340 full time professional employees for research and development activities related to continuing operations.

(6) *Employees*

At the end of 1972, there were 13,085 office and plant personnel employed by the Company in its domestic and foreign operations. This represents a 6.8% increase compared with the 12,251 employed on the same basis in 1971.

(c) Information as to Lines of Business—Continuing Operations

Set forth below are the respective contributions of each line of business to consolidated net sales and earnings. The Company considers the contribution to net sales and earnings before income taxes, interest and corporate expenses, from each of the below mentioned lines of business to be the most meaningful. Accordingly, the Company has recast previously reported sales and earnings by product line to reflect both a change in the lines of business and omission of the allocation of interest and corporate expenses. Therefore, for the purpose of the following presentation, no allocation of these expenses to each line of business has been made.

Lines of Business	Year Ended December 31, 1968	1969	1970	1971	1972
	(In Millions of Dollars)				
	NET SALES				
Industrial Gases and Cryogenic, Welding and Cutting Equipment	$189.0	$196.3	$196.7	$192.3	$240.0
Ferroalloys	88.9	118.2	109.1	103.7	128.3
Carbon-Graphite, Electronics and Metals	50.5	62.5	69.6	77.3	81.3
Medical Gases and Equipment	23.8	26.5	30.2	38.1	42.7
Total	$352.2	$403.5	$405.6	$411.4	$492.3
	EARNINGS				
Industrial Gases and Cryogenic, Welding and Cutting Equipment	$ 20.1	$ 18.4	$ 21.1	$ 21.1	$ 26.8
Ferroalloys	11.4	17.1	17.2	13.0	3.9
Carbon-Graphite, Electronics and Metals	5.8	6.8	5.9	8.0	7.2
Medical Gases and Equipment	4.1	4.4	4.1	5.8	6.2
Total	$ 41.4	$ 46.7	$ 48.3	$ 47.9	$ 44.1

(d) Customer Sales

The Company is not dependent for a material part of its business upon any single customer, or a very few customers, the loss of any one of which would have a materially adverse effect on the business of the Company as a whole.

(e) *Foreign Operations*

The most significant foreign operations of the Company are carried out through its wholly-owned subsidiary, Airco Alloys AB, in Sweden. Reference is made to Note (e) submitted in response to Item 7 which provides information as to foreign operations. Sweden has enjoyed a relatively stable economic and political climate. The Company is not aware of any unusual risks attendant to the operations of Airco Alloys AB.

Item 2. Summary of Operations.

The following Statement of Consolidated Income of Airco, Inc. and subsidiaries for the five years ended December 31, 1972 has been examined by Haskins & Sells, independent certified public accountants whose opinion with respect thereto accompanies other financial statements appearing in Item 10 in this report. This statement should be read in conjunction with its notes and the other financial statements and notes to financial statements included in Item 10.

	Year Ended December 31, (Notes (a), (b) and (c))				
	1968	1969	1970	1971	1972
	(In thousands except per share amounts and ratios)				
Net Sales (Notes (b) and (c))	$352,232	$403,537	$405,634	$411,409	$492,295
Cost of Goods Sold	262,419	309,504	307,249	312,691	394,029
Selling, Administrative and Other Operating Expenses	56,410	57,984	62,139	59,805	63,752
Total	318,829	367,488	369,388	372,496	457,781
Operating Income	33,403	36,049	36,246	38,913	34,514
Other Income—Net	2,003	3,740	4,958	3,455	2,362
Total	35,406	39,789	41,204	42,368	36,876
Interest Expense (principally on long-term debt)	7,856	10,232	11,556	10,707	9,676
Income from Continuing Operations Before Federal and Foreign Taxes on Income and Extraordinary Items	27,550	29,557	29,648	31,661	27,200
Federal and Foreign Taxes on Income (Note (d)):					
Current	2,043	2,481	2,408	811	1,638
Deferred—Net	7,483	8,486	10,135	12,602	7,618
Total	9,526	10,967	12,543	13,413	9,256
Income from Continuing Operations Before Extraordinary Items	18,024	18,590	17,105	18,248	17,944
Income (Loss) from Discontinued Operations (Note (b))	1,439	1,736	(111)	815	77
Income Before Extraordinary Items	19,463	20,326	16,994	19,063	18,021
Extraordinary Items, Net of Income Taxes (Note (b))	1,515	—	(10,500)	—	(16,000)
Net Income	$ 20,978	$ 20,326	$ 6,494	$ 19,063	$ 2,021
Earnings Per Share of Common Stock (Note (e)):					
Income from Continuing Operations	$1.62	$1.65	$1.50	$1.57	$1.53
Income (Loss) from Discontinued Operations	.13	.15	(.01)	.07	.01
Income Before Extraordinary Items	1.75	1.80	1.49	1.64	1.54
Extraordinary Items, Net of Income Taxes	.14	—	(.92)	—	(1.37)
Net Income	$1.89	$1.80	$ .57	$1.64	$ .17
Fully Diluted Earnings Per Share (Note (e)):					
Income from Continuing Operations	$1.53	$1.55	$1.42	$1.49	$1.45
Income (Loss) from Discontinued Operations	.12	.13	(.01)	.06	.01
Income Before Extraordinary Items	1.65	1.63	1.41	1.55	1.46
Extraordinary Items, Net of Income Taxes	.13	—	(.84)	—	*
Net Income	$1.78	$1.68	$ .57	$1.55	$ *
Weighted Average Number of Common Shares Outstanding (Note (e)):					
Earnings Per Share	11,108	11,303	11,432	11,645	11,754
Fully Diluted Earnings Per Share	12,161	12,385	12,557	12,704	12,843
Dividends Declared Per Share of Common Stock	$1.50	$1.15	$ .80	$ .80	$ .80

* Qualified Income amounts are anti-dilutive.

(See accompanying Notes to Statement of Consolidated Income)

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AIRCO, INC. AND SUBSIDIARIES

NOTES TO STATEMENT OF CONSOLIDATED INCOME

(a) Acquisitions

In transactions accounted for as poolings of interests, the Company acquired the net assets and businesses of Welders Supply, Inc., in 1968, in exchange for 33,223 shares of Common Stock held in Treasury, in 1969, the net assets and businesses of Viking Forge and Steel Company and its wholly-owned subsidiary Viking Metallurgical Corporation, Aronson Machine Company, Welco Alloys Corporation, Ledo Welding and Industrial Supply Company and Virginia Welding and Oxygen Company in exchange for 215,119 shares of Common Stock (including 82,619 shares held in Treasury) and, in 1971, in exchange for 49,438 shares of Common Stock, Jackson Welding Supply Company. In the accompanying Statement of Consolidated Income, the operations of the pooled companies acquired in 1968, 1969 and 1971, are included from the year of pooling only, since the aggregate operations of these companies for all periods are not material in relation to the consolidated net sales and operations of the Company.

Operations of Electro-Med Instruments, Inc. purchased, in 1969, for cash; D. D. Richards Supply Company, Inc., of Kansas and Welders Supply Company Incorporated of South Carolina purchased, in 1970, for cash; Electro/Systems, Inc. purchased, in 1971, for cash in addition to certain payments to creditors; and four welding supply companies purchased in 1972 for 35,292 treasury shares of the Company's Common Stock and cash, are also included in the Statement of Consolidated Income from their dates of acquisition. Furthermore, in October 1970, the Company acquired for cash the remaining 50% of Cryostar AG, a manufacturer of cryogenic equipment located in Switzerland, and as of the end of September 1971, the Company terminated a joint venture with British Oxygen Company and is now operating the United States based portion as a wholly-owned subsidiary under the name of Airco Cryoplants Corporation. The operations of Cryostar AG and Airco Cryoplants Corporation are included in the Statement of Consolidated Income from January 1, 1971 and October 1, 1971, respectively. The operations of the above-mentioned acquisitions, for the year of acquisition and the immediate preceding year, are not material in relation to the consolidated net sales and operations of the Company.

(b) Extraordinary Items and Discontinued Operations

In 1968, the Company sold its vinyl fabrics plants, resulting in an extraordinary credit to income of $1,515,000 (net of related income tax charges of $653,000). The sale had no material effect on consolidated net sales and operations.

In 1970 and early 1971, the Company sold its Chemicals and Plastics business and certain Canadian properties and disposed of certain electronic product lines, resulting in an extraordinary charge to income in 1970 of $10,500,000 (net of related income tax effect of $6,737,000).

In January 1973, the Company announced the discontinuance of its Carbide-Acetylene business. The transaction was accounted for at the end of 1972 resulting in an extraordinary charge to income of $16,000,000 (net of related income tax effect of $14,740,000) based on estimated costs in connection with the fulfillment of commitments, termination of operations and the disposition of the carbide-acetylene plant assets.

The net sales and related expenses (including income tax effects of $564,000 in 1968, $1,261,000 in 1969, $36,000 in 1970, $603,000 in 1971 and $8,000 in 1972) applicable to discontinued operations prior to their sale or termination have been excluded from the respective captions in the Statement of Consolidated Income for all applicable years and have been shown net under the caption "Income (Loss) from Discontinued Operations". For 1972, net sales of discontinued operations were $25,694,000. For the four years ended December 31, 1971, the net sales applicable to such operations, together with the respective amounts initially reported, were as follows:

	1968	1969	1970	1971
		(In thousands of dollars)		
Net sales as initially reported	$438,018	$487,264	$436,501	$440,562
Less net sales of discontinued operations:				
Carbide--Acetylene	30,965	30,123	30,867	29,153
Other, principally Chemicals and Plastics	54,821	53,599	—	—
Net sales per statement	$352,232	$403,537	$405,634	$411,409

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AIRCO, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEET

December 31, 1972 and 1971
(In thousands of dollars)

ASSETS

	1972	1971
Current Assets:		
Cash and Short-Term Securities (at cost)	$ 11,642	$ 20,630
Notes and Accounts Receivable:		
Customers	82,533	75,528
Miscellaneous	14,720	11,608
Less Allowance for Doubtful Accounts—Schedule XII	(922)	(703)
Inventories (Note B):		
Finished Goods	73,450	58,150
Goods in Process	31,086	23,765
Raw Materials and Supplies	50,577	41,638
Prepaid Taxes, Insurance and Other Expenses	3,802	3,933
Total Current Assets	266,888	234,550
Investments (principally at equity) (Note A)	3,179	3,928
Long-Term Receivables (Note C)	15,544	16,439
Property, Plant and Equipment—Net (Note D)—Schedule V and VI	307,205	315,187
Goodwill, Patents and Trademarks (Note E)	6,330	5,317
Deferred Charges	8,288	7,885
Total	$607,430	$583,305

LIABILITIES AND STOCKHOLDERS' EQUITY

	1972	1971
Current Liabilities:		
Accounts Payable—Principally Trade	$ 48,555	$ 30,705
Bank Loans	20,130	1,382
Currently Maturing Long-Term Debt—Schedule IX	2,660	2,730
Federal and Foreign Taxes on Income	898	871
Accrued Liabilities:		
Discontinuance of Carbide-Acetylene Business	4,055	—
Deferred Foreign Income Taxes	1,642	2,993
Other Taxes	1,355	1,705
Payrolls and Vacation Pay	2,542	2,169
Interest	2,336	1,686
Other	8,953	6,521
Total Current Liabilities	93,126	50,763
Long-Term Debt (Notes F and G)—Schedule IX	177,325	187,724
Other Liabilities and Deferred Credits:		
Deferred Income Taxes	66,675	73,788
Miscellaneous	7,865	2,796
Total Other Liabilities and Deferred Credits	74,540	76,584
Stockholders' Equity (Notes F, G and H)	262,439	268,235
Commitments and Contingent Liabilities (Note L)		
Total	$607,430	$583,305

See accompanying notes to financial statements.

The following report on operations for 1972 and the first quarter of 1973 was then given by Mr. Dillon:

1972 Sales and Earnings

"In 1972 we had sales of $402.3 million compared to $411 million in 1971. Income from continuing operations was $17.9 million compared to $18.2 million in 1971, or on a per share basis, we earned $1.53 from continuing operations in 1972 compared to $1.57 in 1971.

Extraordinary Charge

"1972 net income reflected an extraordinary charge of $16 million which resulted from discontinuance of our carbide acetylene business. As many of you are aware, we had intended, upon the expiration of our carbide acetylene supply contract with du Pont in March 1973, to convert four of our five carbide furnaces to ferroalloys production. Early in 1972, we began production of ferroalloys in one of our carbide furnaces on an experimental basis. Experimental production continued for about six months and the conversion proved to be feasible, technically. The economics were marginal but would have permitted orderly depreciation of the existing investment, recovery of the new capital within a reasonable period and a modest annual profit. On this basis, we were prepared to go forward. However, late in November 1972, the Tennessee Valley Authority announced a 9 per cent increase in the cost of power, effective January 1, 1973, and indicated an additional increase of 10 per cent would be effective in mid-1973. The impact of these rate increases on our production costs led us to conclude that we should not risk the investment of the new capital required to convert the furnaces and install the necessary air pollution control systems. That left us with no practical alternative other than to write off the facilities and reflect the charge in 1972 income.

1972 Continuing Operations

"1972 earnings from continuing operations were disappointing due to the performance of our ferroalloys business, which for many years has been an important and consistent contributor to profits.

"The fundamental problem was worldwide overcapacity in ferrochrome, which traditionally has been our highest margin ferroalloy. During 1972, South African and Rhodesian ferrochrome producers, whose principal market has been Europe, increased their capacities approximately 50 per cent, an amount equal to about 10 per cent of world consumption of ferrochrome. The European market could not absorb this additional product and most of it was shipped into the United States, increasing imports of ferrochrome by 71 per cent. Despite strong demand in the United States market, this influx of imports led to severely depressed prices, which dropped by 20 per cent from December 1971 levels.

Price Erosion

"During the year, the price erosion spread to ferrosilicon, our second most important ferroalloy. In addition, ferrosili-

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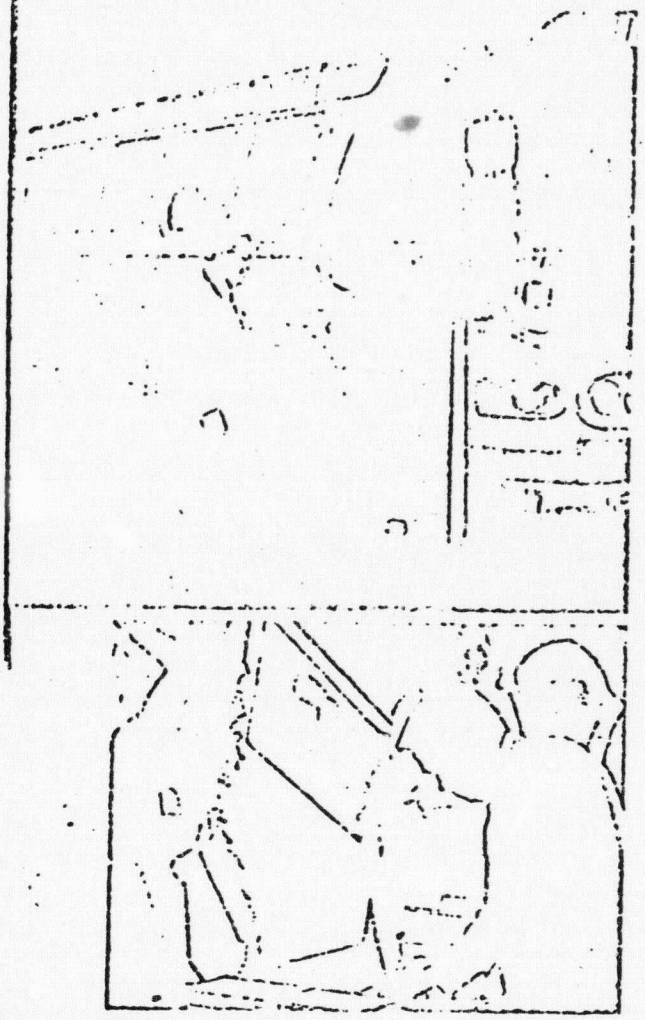


Top: Bus transportation was provided for stockholders traveling from New York City and for employee stockholders headquartered at the new corporate offices in Montvale, N.J. Above: Stockholders register for the 1973 Annual Meeting.

con production costs increased because of an unprecedented number of power shutdowns by TVA at our Calvert City, Kentucky plant, particularly during the fourth quarter.

"Overall, the performance of our ferroalloys business reduced our 1972 earnings by 40 cents per share as compared to 1971.

Gases, Welding, Electronics—Outstanding

"The 1972 earnings performance of our Industrial Gases, Welding Products and Electronics divisions was outstanding, and the earnings of our Ohio Medical Products, Cryogenics and Viking divisions continued to grow in line with the growth rates achieved in these businesses in recent years.

"We incurred a loss in the operation of our Electron Beam Hearth Refining facility at Berkeley, California, that was somewhat less than the loss incurred in 1971. During the year, E-Brite 26-1, the new stainless steel produced in that facility, demonstrated its superior corrosion resistance in actual service in oil refineries and chemical plants. In recent weeks we have completed our program of building a sufficient field inventory of standard mill forms of E-Brite 26-1 to provide the opportunity for a significant increase in sales volume.

Facility Additions

"In 1972, expenditures for facility additions were $44.4 million as compared to $33.8 million in 1971. Major projects were: air separation plants at Fairfield and

Decatur, Alabama; the completion of the 40,000-kilowatt ferroalloys furnace at Vargon, Sweden; the expansion of our cryogenic equipment facility at Irvine, California, and of our forging facility at Verdi, Nevada; and the acquisition of our corporate headquarters in Montvale, New Jersey.

"In 1973, we estimate facility additions at $43 million. Major projects will be: the completion of the air separation plant at Fairfield; the expansion of our air separation plant at Claymont, Delaware; the addition of air pollution equipment at various ferroalloys and graphite plants; and the expansion of our graphite electrode plant at Niagara Falls.

[illegible] Development

"Research and development expenditures for 1972 were $6.7 million. Activities were directed primarily toward new product and process development in support of our medical products, welding products, and graphite businesses, and in new applications development for our electron beam and industrial gas businesses.

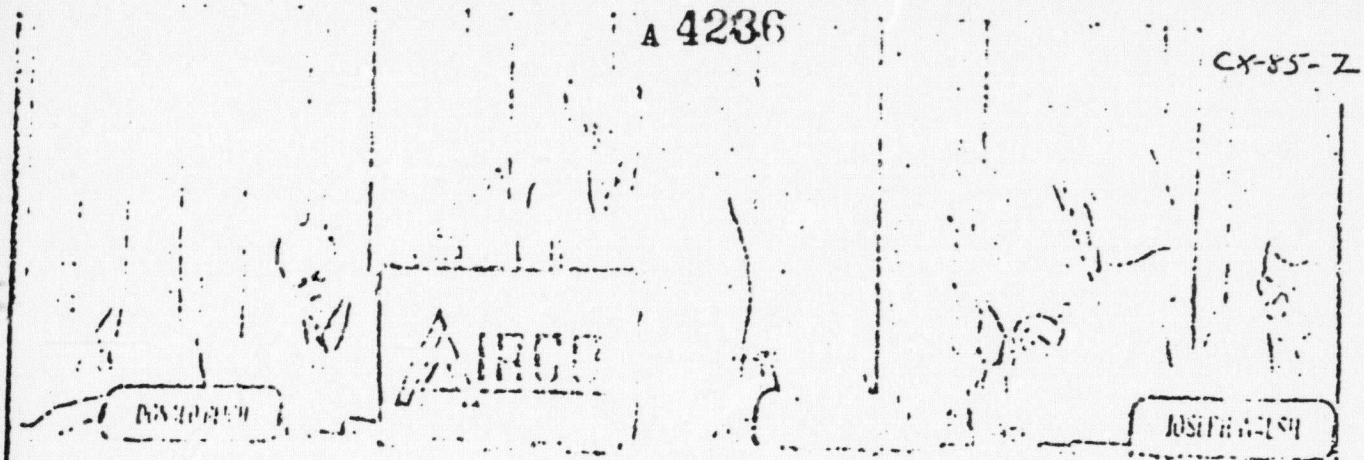
Ethrane Sales Double Forecast

"In November 1972, following FDA approval, our Ohio Medical Products Division introduced a new stable inhalation anesthetic, having the trade name Ethrane, developed in our Central Research Labora-

Arriving stockholders gather in the lobby of the Stanley Warner Theatre in Paramus, N.J.

A 4236

CX-85-Z



Inspector of Election (standing right) reports results of balloting. Company officers on the dais are (left to right): Richard V. Giordano, President; Donald Reich, Vice President-Finance; George S. Dillon, Chairman; Joseph M. Walsh, Jr., Secretary.

tories. This product has been received enthusiastically by the medical profession, resulting in first quarter sales that were double our forecast and enabling Ethrane to produce a profit in the first full quarter it was on the market.

New Water Treatment Technique Developed

"In 1972, we also developed a new technique for the treatment of municipal and industrial waste-water. Its outstanding advantages are high efficiency in dissolving oxygen, and ready adaptability for use in conventional activated sludge process plants without modifying the existing facilities.

"We expect research and development expenditures in 1973 to be somewhat larger than 1972, and to be concentrated in the same general areas.

Labor Relations

"Phase II wage controls greatly improved the climate for collective bargaining in 1972. We settled 32 labor contracts during the year at a first year weighted average wage increase of 6.2 per cent compared to the average 6.9 per cent wage settlements in major manufacturing industries. All but one of our settlements were achieved without a strike.

CX-85-Z-1

"Sixty-five contracts are open for negotiation in 1973, about two-thirds of which cover trucking activities. Settlement of these contracts will be closely related to the settlement reached in the National Master Freight Agreement with the Teamsters Union which expires on June 30, 1973. In addition, we have three major manufacturing plant contracts open for negotiation during the balance of this year.

"Since Phase III has been instituted, it has been characterized by wage demands in excess of the Phase II standard. So far, our 1973 settlements have been within that standard, but we now have a strike at our East Alton, Illinois air separation plant where the demand is for an 11 per cent wage increase.

Price Controls

"During Phase II we increased prices in several of our product lines, but those increases were more than offset by decreases in other product lines. The price increases that have become effective in the first quarter, since Phase III was instituted, are well within the permissible limits. Throughout the control period, market conditions have exerted the principal influence on the price of our products. Controls have not been a significant factor.

1973 First Quarter Sales and Earnings

"In the first quarter of this year, sales were $129.5 million compared to $119.4 million in the first quarter of 1972. Income from continuing operations was $3.7 million compared to $5.8 million, or on a per share basis, we earned 31 cents in 1973 compared to 50 cents in 1972.

"The unfavorable income comparison with the 1972 first quarter was due to our ferroalloys business which operated at a loss. As compared to the first quarter of last year, we had a good earnings improvement in our other businesses, but it was not nearly enough to overcome the ferroalloys earnings gap.

"The loss incurred in ferroalloys in the first quarter was significantly less than the fourth quarter 1972 loss. In fact, the domestic segment of the ferroalloys business was in the black in March. There were other signs of progress in the first quarter. The high rate of production of raw steel in the United States, the European Economic Community and Japan is restoring the balance between supply and demand for ferroalloys, and prices have moved up. Our Calvert City plant was not plagued by the excessive number of power shutdowns imposed by TVA during the last half of 1972, and we have reduced our production and distribution costs significantly. These developments should enable us to make a steady improvement in our earnings from this important segment of our business for the rest of the year.

"I mentioned earlier, but it is worth repeating: in the first quarter, our businesses, other than ferroalloys, continued the same strong earnings performance that characterized 1972. In fact, the March earnings of the corporation as a whole were better than any month since June 1972."

A 4238

CX-85-2-2

Consolidated Statement of Income
Atlantic Richfield Company and Subsidiaries

	Three Months Ended March 31, 1973	1972 (Note 1)
NET SALES	$[illegible]	$119,439,000
OTHER INCOME—NET	[illegible]	432,000
Total	[illegible]	119,871,000
DEDUCTIONS:		
Cost of Goods Sold	[illegible]	91,848,000
Selling, Administrative and Other Expenses	17,626,000	15,224,000
Interest Expense	2,739,000	2,453,000
Federal and Foreign Taxes on Income (Note 2)	1,611,000	4,503,000
Total	126,[illegible]	114,028,000
NET INCOME	$ [illegible]	$ 5,843,000
EARNINGS PER SHARE OF COMMON STOCK (based on average number of shares outstanding during the respective periods) (Notes 1 and 3)	$ .31	$ .50

NOTE:

1. Net Income and Earnings Per Share for the three months ended March 31, 1972 shown above represent Income from Continuing Operations and have been restated to exclude Net Sales of $6,394,000 and Net Income of $4,000 (no effect on Earnings Per Share of Common Stock) applicable to discontinued operations.
2. The total Federal and Foreign Taxes on Income as shown above is less than would result from application of United States tax rates because of the investment tax credit and the fact that taxes have not been provided on undistributed earnings of certain foreign subsidiaries whose earnings are to be reinvested.
3. Fully Diluted Earnings Per Share from Continuing Operations were $.30 for the three-month period ended March 31, 1973, as compared to $.47 for the corresponding period of 1972.

The Statement of Consolidated Income is unaudited. The Annual Statement of Consolidated Income will be verified by independent Certified Public Accountants at the end of the year.

RESTRICTED A 4239

CX-88-1

date 19 July 1973

from Company Secretary

our ref

to Mr J M Williams
Mr P Laister

your ref

cc Director of Group Strategy

BLINDFOLD

Mr Laister asked for a draft of a letter to be exchanged with Airco on the subject of confidentiality. This is attached. It is in the form generally used on occasions such as the present. One may feel at liberty to add or subtract from the items listed in para 1.

I was asked to advise whether BOC could claim to be precluded, under either UK or EEC law, from giving an assurance that, for a period following receipt of this knowledge and information, BOC would refrain from making a bid for Airco. I am bound to say that there are no such legal prohibitions, certainly not if the restraint is contained in a purely bilateral agreement. Moreover, Airco have access to excellent legal advice and if we attempt to put forward unsound legal propositions we are likely to be found out.

Our line to Airco should, I suggest, be that at the moment there is nothing to prevent BOC from making a bid for Airco and then there is enough information about Airco in the public domain to enable BOC to take such a step. The fact that BOC is about to receive some amplification of this information is justification for imposing an obligation of confidentiality on BOC in respect of the further knowledge. It is not justification for asking BOC to preclude itself from rights of action which it held prior to the additional information being communicated.

C A B Leslie

DRAFT LETTER

BOC and Airco are about to enter into discussions directed towards the possibility of a merger of their respective businesses. In consideration of Airco disclosing to BOC the knowledge and information set out in para 1 below, BOC agrees as follows :

1 The knowledge and information to which this agreement relates shall be as follows :

a) Information concerning the ownership and control of shareholdings in Airco.

b) Information relating to Airco's unannounced trading results or forecasts of future turnover or profit.

c) Information relating to persons employed by Airco including the terms of the service contracts.

d) Information concerning the value of the capital assets of Airco.

e) Information concerning the terms upon which Airco's financial arrangements have been made.

f) Information concerning the terms of commercial agreements likely to be significant in their affect upon Airco's trading results.

g) Any other information likely to affect Airco's share price or be of interest to Airco's customers or competitors or to influence anyone's decision to buy or to sell Airco's shares.

2 BOC shall treat as confidential all knowledge and information disclosed to BOC, its officers, advisers, or employees by Airco in the course of discussions referred to above and all acounts and documents pertaining thereto.

3 Except in so far as Airco may otherwise authorise BOC will not for a period of five years from the date hereof disclose or communicate to any other person or company such knowledge and/or information or permit or suffer such knowledge and/or information to be disclosed or communicated to or ascertained by any other person or company.

4 BOC shall be released from the terms of the above covenant in respect of any item of knowledge and/or information forthwith upon such item becoming generally known throughout the industrial gas industry of the United States during the said five year period.

5 BOC gives the above covenants and assurances upon the clear understanding that Airco will give cross covenants and assurances in respect of the like knowledge and information concerning BOC which may be disclosed to Airco in the course of the discussions referred to in this Memorandum.

A 4242 CX-99-4

date 7 November 1973

from Mrs T Fuller our ref

to Mr P G Rosenmet your ref

AIRCO

Before he left this morning, Mr Leslie asked me to hand to you for safekeeping the original of the Secrecy agreement signed by Airco and Mr Laister, and this is attached herewith.

Tina Fuller.

Tina Fuller

Returned to Cabinet 13/12/73.

A 4243

CX-99-B

From P. G. BOSONNET

To Mr C.A.B. Leslie

Copies to: Mr P. Laister
Mr J.M.Williams

For information		For action	
As requested		For your comments	
Note and file		Note and return	
See me re attached		Does attached meet with your approval	
Please reply with copy to me		For signature if you approve	

Herewith original signed copy of Airco 'secrecy' agreement for your file.

PGB/MJC
30.7.73

CX-99-C

A 4244

AIRCO Inc.

60 CHESTNUT RIDGE ROAD, MONTVALE, NEW JERSEY 07645 • TELEPHONE 201 573 0600

RICHARD V. GIORDANO
PRESIDENT

July 25, 1973

British Oxygen Company Limited
Hammersmith House
London W6
England

Gentlemen:

As you know, British Oxygen Company Limited and Airco, Inc., in connection with evaluations of each other's businesses currently being undertaken, have exchanged and may continue to exchange data and other information of a confidential nature relating thereto. We understand that this information was and will be exchanged solely for the purpose of such evaluations and that each of us has been and will be willing to disclose such information only on the following terms and conditions:

1. Each of us has accepted and will accept and keep such information in confidence and has restricted and will restrict its distribution to those of our respective employees and agents who need to know such information for the purpose of evaluating the other's business and who have been informed of the terms and conditions of this understanding as to the confidential nature and treatment of the information and directed to comply therewith.

2. The information will be held in confidence and not disclosed to any third parties (including our respective affiliates) for a period of five years from the date of this letter, and each of us will take necessary and reasonable precautions to prevent any such disclosure during that period, and to destroy or return all copies of such information and of documents

2. (a) "Affiliates" means companies which are subsidiaries of or controlled by our respective companies.

incorporating any substantial part thereof as and when requested by the other party. During the same five year period, neither of us will use such information for commercial purposes without the written consent of the other party.

3. The foregoing commitments will not, however, extend to any information disclosed which was publicly known prior to disclosure pursuant to this understanding, as evidenced by written records, or becomes publicly known after such disclosure through no act or failure of the party to which disclosed, or corresponds in substance to information disclosed to that party at any time by a third party who has a right to make such disclosure and does so in good faith.

4. If any technical data or know-how is involved, disclosure will not be construed as the grant of any license, or of any right to use same except for the purpose stated above.

In addition, it is agreed that, except with the prior approval of the Board of Directors of the other party, neither party will make, or authorize or permit any of its affiliates to make, a tender, exchange or other offer for any securities of the other for a period of five (5) years from the date of this letter.

Very truly yours,

AIRCO, INC.

By R. V. Giordano

R. V. Giordano
President

ACKNOWLEDGED AND AGREED

BRITISH OXYGEN COMPANY LIMITED:

By

A 4246

10 October 197?

Divisional Planning Manager, Advanced Engineering Division
Mr P. Laister
Mr A.I. May
cc: Mr D.M.K. Stafferton

CK-101-A

HARRIS-LAKE

1. A.E.D. wishes to acquire a 100% holding in Harris-Lake Inc. for a sum of $2m (£830K). Harris-Lake is essentially a distributor of a range of medical equipment very similar to BOC's. It also has a limited manufacturing resource.

2. The acquisition of Harris-Lake is in the interest of BOC shareholders because:

(a) It represents an investment in a profitable business related to that of BOC's existing business in anaesthic equipment.

(b) It secures an existing outlet for Harlow production in North America.

(c) It adds a building block on which to expand further in the United States.

3. The detailed case for the acquisition will be the subject of a full board paper. Key information is given here.

	1970	1971	1972	1973 (forecast)
Net Sales	$804K	$1,056K	$1,503K	$1,900K
Income pretax	-	$37K	$150K	$225K
Earnings	-	-	$75K	$112K

(Note that 1971 was the first full year for Harris-Lake. Sales of its predecessor, Harris Medical Division, were: 1968 $500K, 1969 $737K, 1970 $804K, with very small profits.)

The yield to BOC on an investment of $2m assuming that the business continues to develop organically without the addition of significant new products to the range is as follows:

	1973	1974	1975
Net Sales	1900	2350	3000
Income pretax	225	330	420
Earnings	112	165	210
Yield* POST TAX	5.6%	7.5%	8.2%

* Assuming small incremental additions to capital employed in 1974 and 1975.

/ Higher .....

Higher yields in later years may be expected if Harris-Lake's range is extended to include planned new products.

Expressed simply, the cost of Harris-Lake to BOC of $2m is 18 times the forecast 1973 earnings. A.E.D. recognise that this is a high price but it is the going rate for a profitable US medical business.

4. The business is at present owned by Emerson Electric (70%) and George Lake (30%). The current price determinant is Emerson's requirement for a sum of money equivalent to that which they paid when they acquired the Harris Calorific Company net of capital gains tax. Thus, the Emerson equity will cost BOC $1.4m and Emerson will receive $980K. Lake will be paid $600K on which he will pay capital gains tax.

Methods of avoiding the necessity for Emersons to pay capital gains tax are being examined with a view to paying them a sum equivalent to $980K to $1,000K which is what they effectively paid for the business on the purchase of Harris Calorific.

5. The operational case for the purchase rests on the requirement for BOC to expand its sales in the USA which accounts for half the world's market.

Currently, Harlow export $100K of equipment to Harris-Lake. This equipment has a revenue value of $200K to Harris-Lake, i.e. $480K or 25% of Harris-Lake sales. Harris-Lake make Boyles machines under licence from BOC.

Harris-Lake only have a small share of the US anaesthetic equipment business as a whole. Ohio and Forreger have 33% and 15% of the market respectively. The balance is in the hands of Harris-Lake, Fraser Sweatman (that is BOC), Spaco and some other much smaller companies. Thus, Harris-Lake have around 3% of the US market as a whole. However, their share of the local market in Cleveland in which they are situated is a dominant one.

The growth rate of the markets in which Harris-Lake trade is 10% per annum in real terms, i.e. not accounting for inflation.

Harris-Lake are a small company (16 employees) who sell 87% of their volume through 108 distributors. A limited amount of manufacture in Harris-Lake exists and this is mostly concerned with assembly of made out items. There is no R and D facility but in view of the fact that BOC already have one at F.S. Inc. this is not a serious matter.

/ The present .....

CX-101-C

The present management team are highly regarded and are welcome to BOC. Service contracts will be negotiated concurrently with the closing of the acquisition agreements.

This acquisition is essentially a strategic building block which, together with F.S. Inc., F.S. Canada Limited and Medishield Products Ltd (Canada), will form a basis for developing a strong medical equipment business in the U.S.A. - perhaps by pooling of interest deals. As such, this acquisition has more potential than the return on capital,(i.e. yield) indicates.

6. A.C.D. will instruct its North American management to gather such other information as required for the full board paper.

7. Permission is requested to authorise Medishield Inc. management to proceed with a maximum bid of $2m bearing in mind that a lesser sum may be negotiated provided ways can be found to avoid the need for Emersons to pay capital gains tax on the transaction.

JAMES H. MIDDLETON

A 4249

CX-102-A

ORGANIZATION PLANS

OCTOBER 15, 1973

Current Organization

Medishield, Inc. - (Planned as soon as possible)

Sales: $6.7 million Net Profit: $252,000

Assumes responsibility for all medical equipment businesses of B.O.C./Medishield in North America. Provide an attractive merger vehicle for other U.S. and Canadian medical equipment companies on behalf of B.O.C./Medishield. Act as a holding company for subsidiaries listed below.

Medishield Products, Ltd.

(Formerly Medical Division of Canox)

Sales: $1.7 million Net Profit: $ 95,000

Market	$ 000	%
Hospital Anesthesia	950	56%
Hospital Piping	103	6%
Other Pulmonary Function	667	38%

Territory - Canada

Strengths -

Experienced Management

Salesforce Coverage - 14 Salesmen

Service Capability - 3 Servicemen

Distribution - 5 Warehouses

Known reputation for service and reliability

Weaknesses -

No engineering in house

High percentage of distributed products

CX-102-B

Fraser Sweatman (Can), Ltd.

Sales: $612,000 Net Loss: $10,000

Market -

	$ 000	%
Vaporizers marketed through Drug and O.E.M. companies	112	18%
Vaporizer Service	126	21%
Hospital Anesthesia	91	15%
Veterinary Anesthesia	38	6%
Dental Analgesia	245	40%

Territory - Canada

Strengths -

- Experienced Management
- High Market Share Vaporizers
- Highly Profitable Vaporizer Service Lab.
- Well Accepted Dental Analgesia Products

Weaknesses -

- Obsolete product line for hospital anesthesia
- Limited market potential in dental and veterinary lines
- Relative to above, high cost of marketing in Canada due to population/area relationship

CX-102-C

Fraser Sweatman, Inc.

Sales: $2.5 million Net Profit: $55,000

Market -

	$ 000	%
Vaporizers marketed through Drug and O.E.M. companies	800	32%
Vaporizer Service	320	13%
Hospital Anesthesia	285	11%
Veterinary Anesthesia	195	8%
Dental Analgesia	900	36%

Territory - United States

Strengths -

High market share vaporizers

Highly Profitable Vaporizer Service Lab.

Well Accepted Dental Analgesia Products

Engineering & Product Development Capabilities

Modest Manufacturing Facility

Weaknesses -

Lack of experienced general management

Lack of experienced sales management

Unsupervised salesforce - 6 men

Less than optimum manufacturing efficiency

Lack of inventory control system

Lack of confidence among dealer organization due to direct selling practices and lack of management continuity

Obsolete product line for hospital anesthesia

A 4252

CX-102-D

Harris-Lake

(To be acquired Nov. 1973)

Sales: $1.9 million Net Profit: $112,000

Market -

Hospital Anesthesia 100%

Territory - United States

Strengths -

Experienced Management

Good Catalog - Complete Product Line

Good network of anesthesia specialist dealers - approximately 40

Weaknesses -

Small salesforce - 2 salesmen, 3 Mfg. Reps.

Service performed by dealers

No Engineering in House

No Accounting in House

A 4253

CX-102-E

Medishield Orthopedics

(Started Sept. 24, 1973)

Sales: 0 Net Profit: 0

Market -

Orthopedic Implants and Related Devices

Territory - U.S. and Canada

Strengths -

Experienced Management

Good Brand Name - Vinertia

High Quality Products

Weaknesses

Uncertainty over supply - short run

Limited product line

No sales or distribution organization at present

Lack of market recognition - Startup

CX-102-F

Proposed Organization

Medishield, Inc. - No Change

Medishield Products, Ltd. - No Change

Harris Lake - No Change

Medishield Orthopedics - No Change

Changes

Fraser Sweatman (Can), Ltd. and Fraser Sweatman, Inc. reorganized as follows:

Cyprane, Inc. and Ltd.

Sales: $1.4 million

Market -

Vaporizers marketed through Drug and O.E.M. companies	$912,000
Vaporizer Service	$446,000

Territory - U.S. & Canada

Strategy -

Concentrate on Vaporizers, Vaporizer Service and other high technology products capable of being marketed without a salesforce or dealer network through existing marketing channels. Strong R & D emphasis in state of the art type products.

CX-102-6

Fraser Sweatman, Inc. and Ltd.

Sales: $1.8 million

Market -

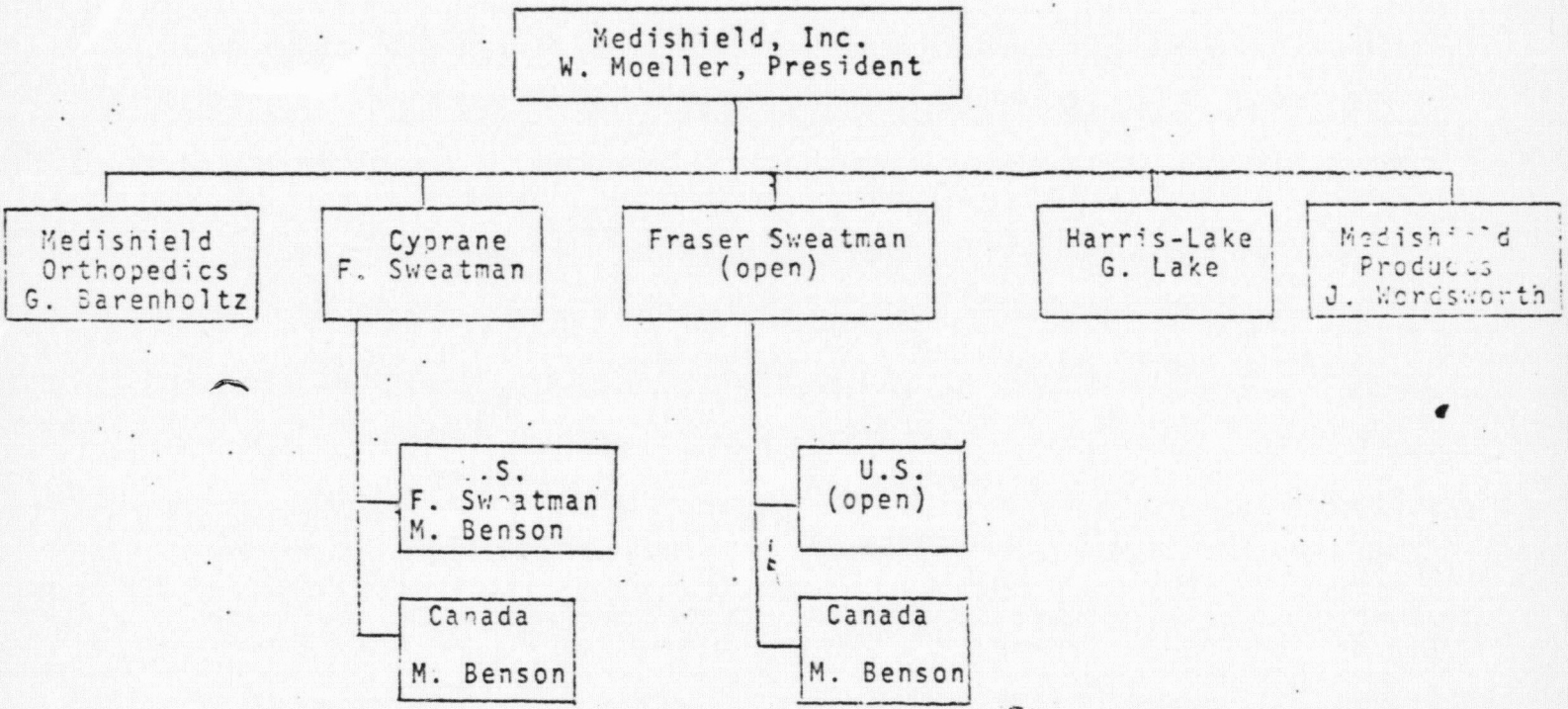
Dental Products	$1,145,000
Veterinary Products	233,000
Other (sales throught affilates)	376,000

Territory - U. S. & Canada

Strategy -

Using the existing products as a base, build a strong marketing oriented company in the Dental and Veterinary markets. Expand salesforce from 6 to 14 salesmen. Develop new Dental & Veterinary products. Shed hospital anesthesia lines to Harris-Lake, Medishield Products and Cyprane as makes sense in light of their strategy.

PROPOSED ORGANIZATION CHART



CX-102-H

A-4256

A 4257

BOC

RJW
To see for P's & L
arrangements
DESTROYED

date 22 November 1973

from Ralph C Hopton

our ref RCH/IK

to Mr P Laister
✓Mr A I Ray

your ref

CX-107

cc Mr D W E Stafferton
Mr C A B Leslie
Mr P G Bosonnet

HARRIS-LAKE

1. The acquisition by BOC Holdings of 70% of the capital of Harris-Lake Inc was completed in St Louis on Tuesday, 20 November and the $1.4m was duly paid to Emerson Electric Co.

2. The purchase of the remaining 30% from George Lake is scheduled to take place in New York on or about 28 November and for this purpose:-

   (a) $202,000 will need to be available in New York on that date.

   (b) BOC Holdings will be required to sign promissory notes, each for $213,000 maturing January 1974 and January 1975. RCH holds a Power of Attorney which would enable him to sign those documents on behalf of BOC. The completion will be managed on our behalf by Medishield's New York lawyers, Feit & Ahrens.

Original signed by
R. C. HOPTON

Ralph C Hopton

EXHIBIT C

CX-108-A

MEMORANDUM AGREEMENT

WHEREAS, BOC Financial Corporation ("BOC Financial") a subsidiary of The British Oxygen Company Limited ("BOC") expects to become a significant shareholder of Airco, Inc. ("Airco");

WHEREAS, BOC and Airco deem it desirable to remove uncertainties as to their intentions and future relationships;

NOW, THEREFORE, BOC and Airco agree as follows:

1. Airco consents under the agreement between Airco and BOC dated July 25, 1973 to BOC Financial making the tender offer described in the attached offer to purchase. BOC and Airco agree that the said agreement shall continue in full force and effect; provided, however, that if any person, without BOC's prior acquiescence, acquires 20% of the outstanding shares of Airco, or hereafter files with the Securities and Exchange Commission materials required in order to acquire or to make an offer with respect to which there has been no filing on the date hereof to acquire such shares which would bring the aggregate of such person's holding of such shares to 15% or more of the outstanding shares, then the agreement between BOC and Airco of July 25, 1973, shall, to the extent it would limit BOC's right to make a tender, exchange or other offer, cease to be applicable.

CX-108-B

2. Airco agrees that so long as BOC holds or owns directly or indirectly 1,000,000 or more of the outstanding shares of Airco, the Board of Directors of Airco, at each meeting of shareholders of Airco for the election of directors, will nominate persons recommended by BOC in the number which bears the same relationship to the total number of persons to be nominated as the number of shares of common stock of Airco held by BOC bears to the total number of outstanding shares of common stock of Airco.

3. In the event that BOC directly or indirectly acquires 2,400,000 or more of the outstanding shares of Airco, BOC has the intention of inviting George S. Dillon and Richard V. Giordano to become members of the Board of Directors of BOC.

4. BOC or any BOC subsidiary or associate company will not transfer, except to BOC or a BOC subsidiary or associate company (by sale, assignment, or other disposition), any Airco shares owned by it, without first giving Airco the right within a reasonable period of time to purchase or designate a purchaser for such shares in whole, for cash in an amount equivalent in value to the consideration for which BOC Financial or such subsidiary or associate of BOC proposes to sell such shares to the proposed transferee.

This agreement shall be governed by the laws of New York, except that paragraph 4 shall be subject to exchange

control and similar laws of England.

THE BRITISH OXYGEN COMPANY LIMITED

By _____

AIRCO, INC.

By _____

Dated: December 10, 1973

CX-109-A

PAUL, WEISS, RIFKIND, WHARTON & GARRISON
345 PARK AVENUE
NEW YORK, N.Y. 10022

TELEPHONE (212) 935-8000
TELECOPIER (212) 823-8302

CABLE LONGSIGHT, N.Y.
TELEX 12-7831

RANDOLPH E. PAUL (1946-1956)
LOUIS S. WEISS (1927-1965)

JOHN F. WHARTON
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COUNSEL

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SIMON H. RIFKIND
LLOYD K. GARRISON
HOWARD A. SEITZ
ADRIAN W. DEWIND
MORRIS D. AUBAM
MORDECAI ROCHLIN
PAUL J. NEWLON
JOSEPH S. ISEMAN
JAMES B. LEWIS
THEODORE C. SORENSEN
MARTIN KLEINBARD
RICHARD M. PAUL
NORMAN ZELENKO
JOHN E. MASSENGALE
JAY H. TOPKIS
EDWARD N. COSTIKYAN
ROBERT H. MONTGOMERY, JR.
JOHN C. TAYLOR, JR.
BERNARD H. GREENE
ERNEST RUBENSTEIN
ALLAN D. ECKER
STUART RODINOWITZ
JAMES L. PURCELL
ARTHUR KALISH
DAVID T. WASHBURN
BERNARD FINKELSTEIN
ARTHUR L. LIMAN
RICHARD R. DAVIDSON
SEYMOUR HENTZ
WALTER F. LEINHARDT
GERALD O. STEIN
ANTHONY B. KUKLIN
MARTIN LONDON
DAVID C. BROADHEAD
PETER R. HAJE
LEONARD V. QUIGLEY
ALLAN BLUMSTEIN
NEALE M. ALBERT
JAY GREENFIELD
KEVIN J. O'BRIEN
ALFRED D. YOUNGWOOD
DONALD F. MOORE
JOSEPH E. BROWDY
SIDNEY S. ROSDEITCHER
ROBERT L. LAUFER
ALLEN L. THOMAS

WRITER'S DIRECT DIAL NUMBER

(212) 935-8702

January 30, 1974

Gordon Youngwood, Esq.
Federal Trade Commission
425 13 Street, N.W.
Room 932
Washington, D. C.

File No. 7410005

Dear Mr. Youngwood:

I enclose the following documents and provide the following information which BOC has supplied to us:

1. A document reciting the annual sales by Hancock to Union Carbide from 1965 to date and the name under which Union Carbide sells Hancock machines;

2. A list of BOC purchases of helium for the period 1970 through 1973 from United States suppliers;

3. A brief history of BOC's entry into industrial gas markets in Australia, Canada, India, Pakistan, Ceylon, Africa, South Africa, Nigeria, Rhodesia, Kenya. Zambia, Singapore, Malaysia and Hong Kong;

4. BOC sales of anaesthetic equipment in the Uni States from 1965 to date; and

5. A copy of the Telex received by our firm on December 17, 1973 which includes preliminary listings of sales figures of BOC which Mr. Laister referred to during his testimony.

I believe there are a couple of outstanding requests and we shall attempt to clear them up within the next few days.

Cordially yours,

Peter F. Gold

AIR MAIL - SPECIAL
DELIVERY - RETURN
RECEIPT REQUESTED

A 4262

SERIALS 9/10 CX-109-B

Annual sales by Hancock to Union Carbide, 1965 to date:

1965	£ 75,000
6	80,000
7	90,000
8	80,000
9	95,000
1970	120,000
1	95,000
2	105,000
3	120,000

Hancock machines are sold by Union Carbide under their trade mark 'Linde' Cutting Machines.

CX-109-C

HELIUM

Purchases of Helium from Airco by Special Gases over the past four years as follows:

1970	£ 5,965	
1971	£ 33,673	
1972	£ 33,359	
1973	£ 29,108	
	£102,105	Total over four years

There are not any records prior to 1970.

A 4264

CX-109-D

AUSTRALIA

The Commonwealth Industrial Gases Ltd

Following a feasibility study in 1909-10, BOC decided to enter the Australian market and a site was secured in Sydney in 1911 for the erection of an oxygen factory. A company called Commonwealth Oxygen and Accessories Limited (COMOX) was formed in 1912 as a BOC subsidiary operating in New South Wales. About that time and subsequently, a multiplicity of small competing companies with overlapping transport systems were formed. In 1934, Mr S.J.L. Hardie went to Australia with the aim of bringing about a merger of the many oxygen and dissolved acetylene producing concerns in Australia. In this he was successful and a new company called The Commonwealth Industrial Gases Limited was formed in 1935 with BOC as the major shareholder.

Thus BOC first entered the Australian market when the country was little industrialised and built up its interests at a time when the market was very small.

A 4265

SERIAL 15

CX-109-E

CANADA

Canadian Oxygen Ltd.

The formation of the Canadian company was, in the first instance, a grass roots affair. It was done in furtherance of BOC's post-World War II policy to establish itself throughout the British Commonwealth. The company was incorporated on 25 October 1949 under the name British Oxygen Canada Ltd on a 47 acre site purchased at Etobicoke.

The grass roots policy proved a failure and British Oxygen Canada lost money for approximately 12 years. We only succeeded in changing this situation after increasing the volume by the acquisition of numerous distributors and small independent producers, of which Peoples Gas, Dinsmore and Scott-Foster were the three largest. All together there were about 20 acquisitions before Canox achieved the size and scale of operation which made it viable

The company name was changed to Canadian Oxygen Ltd in 1963.

A 4266

CX-109-F

INDIA

Indian Oxygen Co Ltd.

The oxygen industry in India dates back to the early years of this century when The Linde British Refrigeration Company was formed to exploit the Linde system of air separation. One of the directors was Mr T.B. Lightfoot who was also the Managing Director of The Lightfoot Refrigeration Company, to whom had been granted the rights to exploit the Linde system in India. When BOC (then Brin's Oxygen Company) acquired the British rights in the Linde patents, an agreement was entered into with the Lightfoot Company whereby BOC participated in the oxygen business in India. The Lightfoot Company continued to run the oxygen plants at Calcutta and Bombay.

The business in dissolved acetylene was mainly in the hands of two producers - Allen Liversidge (India) Limited (some 20 years later to become a subsidiary of the British Company of that name) who had works at Bombay, and The Gas Accumulator Company (India) Limited who produced not only dissolved acetylene but also oxygen at Calcutta.

As in the case of Australia, Mr S.J.L. Hardie brought about a merger of the several gas producing companies on 24 January 1935 under the name The Indian Oxygen & Acetylene Company Limited.

A 4267

CX-109-6

Pakistan Oxygen Ltd

Ceylon Oxygen Ltd

Both Pakistan Oxygen and Ceylon Oxygen were essentially started as extensions of Indian Oxygen Ltd.

Both were separated after independence and East and West Pakistan have been further separated since the recent civil war.

Again it can be seen that BOC's interest in these territories stems from the earliest days of industrialisation.

A 4268

SERIAL 15

AFRICA

CX-109-11

OTHER BOC COMPANIES

NIGERIA : Industrial Gases Ltd

Our entry into Nigeria was through buying a 50% interest into an existing business in 1959.

51

RHODESIA : Rhodesia Oxygen (Pvt) Ltd

KENYA : East African Oxygen Ltd

ZAMBIA : Zambia Oxygen Ltd

Each of the above companies were originally formed as an extension of African Oxygen Ltd, but were later separated into individual companies after independence in South Africa.

A 4269

SOUTH AFRICA

CX-109-I

African Oxygen Ltd

In 1927 two UK Companies, Hydrogen Oxygen & Plant Co Ltd (HOPCO) and Allen Liversidge Ltd (A-L), formed Allen Liversidge Industrial Gases (South Africa) 1927 (Pty) Ltd with oxygen and dissolved acetylene works at Germiston. Following the mergers of HOPCO and A-L with BOC in 1930, the name of the South African company was changed (in 1931) to African Oxygen & Acetylene (Pty) Ltd. At that time BOC had only a minority holding in the African company.

In 1934, British Oxygen purchased a controlling interest in the company and in 1955 purchased the minority shareholdings, thus making the company a wholly owned subsidiary of British Oxygen.

On 8 May, 1957, the company was converted into a public company and the name changed to African Oxygen Limited.

A4270

SERIAL 15

CX-109-J

SINGAPORE, MALAYSIA & HONG KONG

Singapore Oxygen Pte Ltd,
Malayan Oxygen Sdn Berhad,
British Oxygen (Hong Kong) Ltd,
Hong Kong Oxygen & Acetylene Co Ltd.

These separate operations followed grass root developments started during the period 1948 - 1950 when the territories were very little industrialised. Despite a very rapid growth in these markets which took place in the 50s and 60s, the operations were difficult and had several years of struggle and unprofitability in competition with the single established producer in that area - L'Air Liquide.

All these markets have grown rapidly and are compact and small and hence easily controlled in comparison with the large and widespread market places of Western Europe and North America.

RESTRICTED

SALES BY AED UNITS OF ANAESTHETIC EQUIPMENT IN U.S.A.

	1964/65	65/6	66/7	67/8	68/9	69/70	70/1	71/2	72/3
FS Inc (US$)	604,721	1,078,618	973,246	1,024,862	1,108,544	1,437,885	1,926,992	2,145,484	2,498,146
Cyprane Inc (US$)	13,682	69,100	97,830	119,704	166,334	210,555	227,930	258,499	-
Sub Total (US £)	618,403	1,147,718	1,071,076	1,144,566	1,274,878	1,648,420	2,154,922	2,403,983	2,498,146
FS Inc/Cyprane Inc Sub Total (£)	220,858	409,899	382,527	476,902	531,199	686,842	865,430	993,381	1,036,575
Harlow (£)	2,780	2,844	2,676	1,190	3,787	5,359	6,287	10,495	7,053
Cyprane (£)	66,494	113,336	86,232	64,276	128,735	143,036	156,954	157,214	252,002
TOTAL (£)	290,132	526,079	471,435	542,368	663,721	835,237	1,028,671	1,161,090	1,295,630

NOTES

1. Excluded above are sales by FS Canada to FS Inc., which are insignificant.
2. A small amount of export sales by FS Inc., are included in figures for that unit.
3. Cyprane sales for 1964/65 are for 10 months.
4. Harlow sales are, as requested of anaesthetic equipment only; these represent about 6-11% (depending on year) of total medical equipment sales by Harlow to USA.
5. Above excludes relatively small anaesthetic equipment sales by Saccab to USA (Total 1972/73 sales to American continent were £940). Details have been requested from Saccab.
6. Exchange rates used for conversion from US $:

1964/65 - 1966/67	US $ 2.80 to £
1967/68 - 1969/70	US $ 2.40 to £
1970/71	US $ 2.49 to £
1971/72	US $ 2.42 to £
1972/73	US $ 2.41 to £

AED/PVC/DW/16th January 1974

A-4271

CX-709-K

A 4272

BEST COPY AVAILABLE

12/17/73

Read CX-109-L

2.10 P.M.

T
WCA1355/17+
PAULWEISS NYK

BRITOXYGEN LDN 26666A

17DEC73 0C/1135 MDC
...

ATTN: DEWIND PAUL WEISS NEW YORK

RE YOUR SPECIFICATIONS ITEM 7. BOC GROUP SALES IN US DOLLARS '000 FROM 1965 TO 1973 (YEARSENDING 30 SEPT) AS BELOW:

US COMPANIES (SINCE ACQUISITION)	LELAND	EHV (INC)	CYPRANE/FRASER SWEATMAN
	DLRS. '000	DLRS. '000	DLRS. '000
1965-67	NOT ACQUIRED		
1968	-	1247	-
1969	-	2176	-
1970	64	1970	-
1971	743	1476	-
1972	947	1674	472
1973	990	1339	8342

LELAND SELLS BOC SYPHONS AND BULBS. MARKET SHARE OF GIFT MARKET NEGLIGIBLE.
EHV SELLS VACUUM ENGINEERING EQUIPMENT MARKET SHARE 5-10 PERCENT
CYPRANE SELLS ANAESTHETIC AND DENTAL EQUIPMENT. MARKET SHARE IN MEDICAL EQUIPMENT GENERALLY NEGLIGIBLE BUT HIGH IN SPECIALIST ANAESTHETIC VAPORISER SECTOR.

EXPORTS FROM UK

	CRYOPLANTS	WELDING PROD. DIVISION	METALS DIV.	MED.EQUIP.	SPARKLETS
	DLRS. '000	DLRS. '000	DLRS. '000	DLRS'000	DLR. '000
1965	-	25	-	112	171
1966	-	54	-	161	641

1965	-	[illegible]	-	[illegible]	[illegible]
1966	-	[illegible]	-	[illegible]	[illegible]
1967	-	-	-	[illegible]	[illegible]
1968	-	[illegible]	[illegible]	[illegible]	[illegible]
1969	-	[illegible]	[illegible]	[illegible]	[illegible]
1970	-	[illegible]	[illegible]	[illegible]	[illegible]
1971	-	[illegible]	[illegible]	[illegible]	[illegible]
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

WELDING PRODUCTS MARKET SHARE NEGLIGIBLE.
METALS MARKET SHARE IN CHROME HIGH (2% PERCENT) NEGLIGIBLE IN OTHER METALS. MEDICAL EQUIPMENT MARKET SHARE NEGLIGIBLE.
CRYOPLANTS SELL AIR SEPARATION PLANT. MARKET SHARE NEGLIGIBLE
BETWEEN 1968 AND 1971 SALES WERE THROUGH ASSOCIATED COMPANY
BOC/AIRCO LTD WHICH WAS 50 PERCENT OWNED BY EACH PARTNER.

CX 109-14

EXPORTS FROM OVERSEAS COMPANIES

	ODDA	SMITWELD	CANOX
	DLRS. '000	DLRS. '000	DLRS. '000
1965	240	NIL	NIL
1966	240	"	"
1967	240	"	"
1968	240	"	"
1969	240	"	"
1970	240	"	"
1971	249	120	536
1972	254	120	947
1973	557	60	1145

ODDA SALES TO 1970 ESTIMATED. PRODUCT MAINLY DICYANDIAMIDE
MARKET SHARE NOT KNOWN.
SMITWELD SELL WELDING PRODUCTS. MARKET SHARE NEGLIGIBLE.
CANOX HARD FACING WELDING MATERIALS. MARKET SHARE NEGLIGIBLE

BOC ALSO HAD 24 PERCENT INTEREST IN HARRIS CALORIFIC INC.
THROUGHOUT PERIOD (DISPOSED OF IN 1973). SALES NOT AVAILABLE
FROM THEIR PUBLISHED ACCOUNTS.

STEVESTER "

[illegible]
[illegible]

A 4274

CX-1106-A

PAUL, WEISS, RIFKIND, WHARTON & CARRISON
345 PARK AVENUE
NEW YORK, N.Y. 10022
TELEPHONE (212) 935-8000
TELECOPIER (212) 935-8302
CABLE LONGSIGHT, N.Y.
TELEX 12-7851

RANDOLPH E. PAUL (1946-1956)
LOUIS S. WEISS (1927-1950)

JOHN F. WHARTON
ROBERT E. SAMUELS
COUNSEL

WASHINGTON OFFICE
1775 K STREET, N.W.
WASHINGTON, D.C. 20006
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CABLE LONGSIGHT WASHINGTON

SIMON H. RIFKIND
LLOYD K. GARRISON
HOWARD A. SEITZ
ADRIAN W. DEWIND
MORRIS B. ABRAM
MORDECAI ROCHLIN
PAUL J. NEWLON
JOSEPH F. ISCHMAN
JAMES D. LEWIS
THEODORE C. SORENSEN
MARTIN FLEISCHMANN
RICHARD M. PAUL
NORMAN ZELENKO
JOHN E. MASSENGALE
JAY H. TORKS
EDWARD N. COSTIKYAN
ROBERT M. MONTGOMERY, JR.
JOHN C. TAYLOR 3D
BERNARD W. GREENE
ERNEST RUBENSTEIN
ALLAN B. ECKER
STUART ROBINOWITZ
JAMES L. KUPFELL
ARTHUR KALISH
DAVID F. WASHBURN
BERNARD FINKELSTEIN
ARTHUR L. LIMAN
RICHARD R. DAVIDSON
SEYMOUR HERTZ
WALTER F. LEINHARDT
GERALD D. STERN
ANTHONY B. KUKLIN
MARTIN LONDON
DAVID C. BROOMHEAD
PETER R. HAJE
LEONARD V. QUIGLEY
ALLAN BLUMSTEIN
NEALE W. ALBERT
JAY GREENFIELD
KEVIN J. O'BRIEN
ALFRED D. YOUNGWOOD
DONALD F. MOORE
JOSEPH E. BRODY
SIDNEY S. ROSDEITCHER
ROBERT L. LAUFER
ALLEN L. THOMAS JR.

WRITER'S DIRECT DIAL NUMBER

(212) 935-8702

January 24, 1974

Gordon Youngwood, Esq.
Federal Trade Commission
425 13 Street, N.W.
Room 932
Washington, D.C.

File No. 7410005

Dear Mr. Youngwood:

I enclose the following documents and provide the following information which CANOX has just supplied to us:

1. A summary of CANOX trade sales for the period 1965 through 1973;

2. An executed letter of intent between CANOX and Canadian Liquid Air dated March 22, 1973. No formal agreement has been entered into.

3. CANOX manufacturing facilities* are situated as follows:

Industrial gases	Toronto, Ontario
Filler metals (Arcweld)	Montreal, Quebec
Stellite rods & castings (Delero)	Belleville, Ontario
Carbon dioxide	Niagara Falls, Ontario
Plastic body filler (Tumbler)	Scarborough, Ontario

* Canadian Helium Limited is 1/3 owned by Gulf Corporation, L'Air Liquide and BOC, respectively. It is neither a subsidiary of BOC nor of CANOX. Canadian Helium has a helium recovery plant in Swift Current, Saskatchewan, and helium cylinder filling plants in Toronto, Ontario and Montreal, Quebec.

CX-110-B

The above manufacturing facilities distribute to all provinces of Canada. Only filler metals and stellite rods and castings are exported in a minor way to various other countries.

4. Neither CANOX nor any of its subsidiaries have sold industrial gases to the United States and no such sales are contemplated.

CANOX has sold mild steel electrodes to the United States in 1972 and 1973, but it has not accepted orders since November 1973 from the United States because of raw material shortages.

Delero Stellite ("Delero"), sells castings to the United States and rebuilds various products with Stellite for United States customers. Although it plans to accept further orders from the United States, Delero has no plans to increase its sales effort.

5. There are no product exchange agreements with United States companies for delivery of products to the United States by CANOX or any of its subsidiaries. Neither are there any product exchange agreements calling for delivery of products from the United States to Canada with CANOX or any of its subsidiaries.

6. Neither CANOX nor its subsidiaries have purchased helium from Airco during the period 1965 to date.

During the period May 30, 1969 through June 30, 1969 CANOX placed three orders for 500 liters each of Liquid Helium with Gardner Cryogenics to test the possibilities of Liquid Helium sales in Canada. The total value of these purchases was $1,140. Sales of Liquid Helium proved unfeasible and uneconomical and efforts were discontinued.

I should note that you requested a copy of the Airco-BOC joint venture agreement at the deposition of Mr. Laister. We supplied that document with our initial production of documents.

There are still several outstanding requests by you which we shall clear up presently.

With best wishes.

Cordially yours,

Peter F. Gold

AIR MAIL - SPECIAL DELIVERY
RETURN RECEIPT REQUESTED

CANADIAN OXYGEN LIMITED

SUMMARY OF TRADE SALES
YEARS ENDED SEPT. 30, 1965-1973

	Hard Goods	Gases	Medical Equipment	Arcweld (1)	Deloro (2)	Tumbler (3)	CO_2 (4)	Cer[illegible]
[illegible]	4,411,073	307,146	510,960					
[illegible]	[illegible] 3,198	319,730	579,258					[illegible]
[illegible]	[illegible] 3,393	367,636	638,020					[illegible]
[illegible]	[illegible] 6,991	362,341	701,901					[illegible]
[illegible]	[illegible] 5,328	399,759	839,189					[illegible]
[illegible]	[illegible] 2,980	503,834	1,124,907					[illegible]
[illegible]	[illegible] 6,306	637,005	1,276,903	7,470,588	*2,017,245	** 2,070,820		[illegible]
[illegible]	7,515,831	707,927	1,474,200	6,226,916	2,628,782	1,305,736		[illegible]
[illegible]	8,919,297	785,781	1,655,931	7,072,065	3,415,294	1,455,444	940,483	[illegible]
						1,646,171	1,136,430	[illegible]

* 9 months ** 21 months

[illegible] assets of Air Reduction Canada Limited - Sept. 30, 1970
[illegible] Canadian assets of Deloro Stellite Limited - Jan. 1, 1971
[illegible] acquisition - August 26, 1969 as at Jan. 1, 1969
[illegible] division from Arcweld assets - Oct. 1, 1971

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A-4276

A 4277

EX-110-0

Our File No.
Your File No.

March 22, 1973.

Canadian Liquid Air Limited,
1210 Sherbrooke Street West,
MONTREAL 110, P.Q.

Attention: Mr. Alfred G. Dyke,
Marketing Manager.

Dear Mr. Dyke,

This letter will confirm our intent to enter into a five (5) year agreement with Canadian Liquid Air Limited for the supply of gases.

It is agreed that the 'Principles of Agreement' will be signed on or before June 1, 1973, and will include the following points;

1. Term - 5 years (effective date can be specified later).

2. Pricing - as per the attached schedule.

3. Minimum volume requirements - as per the attached schedule.

4. Supply points - as indicated on the attached schedule.

5. Products to be supplied - as per the attached schedule.

6. 'Force Majeure' - neither CLA nor Canox will be required to meet its obligations under conditions of 'Force Majeure'.

   This is defined as "any event of war, civil disturbance, explosion, flood, fire, lockout, strike, work stoppages, riot, shortage of either materials, labor or transport, power shortage, act of governmental authority (valid or invalid), act of God or other eventuality beyond the reasonable control of either or both of the parties hereto".

7. Price Adjustment

   All prices will be adjusted in accordance with formulas which will allow CLA to [illegible]

... 2

A 4278

CX-110-E

Canadian Liquid Air Limited,
Mr. Alfred G. Dyke,
Marketing Manager.

March 22, 1973.

Please sign and return one copy of this letter and one copy of the attached price schedule to indicate your acceptance.

Yours sincerely,

ACCEPTED BY:

Canadian Liquid Air Limited

Date: April 2/73

Alfred G. Dyke

Canadian Oxygen Limited

Date: March 23/73

General Manager, Industrial Div.

EX-110-F

PRICE SCHEDULE FOR LIQUID & CYLINDER GASES

a) LIN/LOX Combined:

National minimum take-or-pay equal to 6,000,000 c.f./mo.

Minimum take-or-pay in Hamilton equal to 3,000,000 c.f./mo.

The minimum take-or-pay volumes will be averaged out over the period of 12 months.

Basic Price - F.O.B. Hamilton - 9¢/100 c.f.

Plant Point Differential: - add to basic price.

Montreal	4¢/100 c.f.
Winnipeg	15¢/ "
Edmonton	15¢/ "
Calgary	20¢/ "
Vancouver	15¢/ "

b) High Pressure Cylinder Oxygen, Nitrogen and Compressed Air:

At each location the following shall apply and shall be added to the basic price plus the plant point differential for the location (F.O.B. CLA plant).

First 50,000 c.f./mo.	$0.80/100 c.f.
Next 50,000 "	0.60/ "
Next 200,000 "	0.40/ "
Next 200,000 "	0.25/ "
Excess "	0.20/ "

c) Cylinder Argon: (F.O.B. CLA plant)

Hamilton	$2.85/100 c.f.
Montreal	3.20/ "
Winnipeg	5.35/ "
Edmonton/Calgary	6.35/ "
Vancouver	5.35/ "

d) Cylinder CO2: (F.O.B. CLA plant)

Winnipeg	$0.075/lb. for 50 lb. cyls
Edmonton	"
Calgary	"
Vancouver	"

.../2

PRICE SCHEDULE FOR LIQUID & CYLINDER GASES (Cont.)

CX-110-G

e) Cylinder Acetylene: (F.O.B. CLA plant)

Varennes *	$1.60/100 c.f.
Winnipeg	3.60/100 c.f.
Edmonton	3.80/ "
Calgary	3.80/ "
Vancouver	2.80/ "

* Minimum take-or-pay of 1,000,000 c.f./mo. averaged out over a 12 month period.

* If in the case of force majeure and/or plant shutdowns or breakdowns we have to supply from carbide generators, the price will be $2.20/100 c.f.

f) Oxygen and Nitrogen in Liquid Cylinders

The price for liquid cylinders at Winnipeg, Edmonton and Calgary will be 10¢ lower than the earned price for Oxygen and Nitrogen in high pressure cylinders.

g) Liquid Argon - Hamilton

The price for liquid argon F.O.B. our plant in Hamilton will be $1.50/100 c.f. This can be delivered to your Toronto plant for a delivery charge of between $40.00 and $60.00 per trip depending on the size of the load delivered.

ACCEPTED BY:

[illegible]

A 4281

CX-111-A

COPY (original)

THE BRITISH OXYGEN COMPANY
LIMITED

HAMMERSMITH HOUSE LONDON W6

RIVERSIDE 2020 TELEX 22853 BRITOXYGEN LONDON WC

25 April 1968

[illegible] ARCHIVES

Dear Dr Muller,

CONSULTANCY

Dr Gross has asked me to reply formally to your letter to him of 2 April. This matter has now been approved by BOC Board and I am authorised to write offering you a consultancy in the following terms:-

1. Your activities on our behalf would be in the following field:-

   (a) Studies of the environment in which our industry is going to work in say 10 years' time both in the US and elsewhere in the world.

   (b) Technological forecasting of US trends which may have significant impact on present BOC business and future plans.

   (c) Identification and critical analysis (both technical and economic) of new products or processes falling within BOC's range of interests, and generally assisting BOC corporate planning staff in this regard.

   (d) Development of promising business opportunities for BOC in the US and with US companies abroad.

   Not necessarily in this order.

from
COMPANY SECRETARY

2. Your principal contact in BOC would be the Joint Managing Directors, but other senior staff of BOC would consult you from time to time on the problems arising in the field defined above. In addition to these specific consultations it would be helpful if, as suggested in your letter, you could provide us with a regular report. For a trial period it is suggested that this should be on a quarterly basis.

3. You should devote 50% of your total working time to BOC's interests; for the remainder you would be at liberty to work for other concerns, subject to the identity of these being first disclosed to BOC, and BOC confirming to you in writing that it has no objection. If BOC should have an objection, then we would expect you to withdraw from the other activity.

4. As you anticipate in your letter, we have to make certain formal stipulations regarding our commercial and industrial rights:-

(a) All commercial rights in the outcome of any work done by you under the terms of this consultancy would belong to BOC.

(b) We would expect you to assist and co-operate in all formal steps necessary to procure the registration of patents, registered designs etc, in BOC's name, both in the US and elsewhere.

(c) Quite apart from the above, any information about BOC and its activities which may reach you in the course of this relationship are to be regarded as confidential. In particular we would require you not to publish any material derived from your knowledge of our affairs without prior clearance with ourselves.

The above obligations concerning confidentiality to remain binding upon you after the termination of this consultancy.

5. It is suggested that this arrangement should be for two years from 1st April 1968, and should be terminable by three months' notice by either side, expiring on any date after 1st April 1970. Naturally we hope that the relationship will continue for much longer than the minimum two years.

6. For this consultancy service we would suggest a fee of £33,000 per annum, to be paid by monthly instalments into a bank account nominated by you in the US.

7. It is noted that you will be using your home as an office location. In addition to the remuneration referred to above, BOC will reimburse your reasonable expenses under the following heads:-

(a) Miscellaneous office equipment, rental and supplies.

(b) Part time secretarial services.

(c) Telephone and communications.

(d) Travel

(e) Such fees as may be required for financial reports, legal assistance etc.

We will provide you with an account in the US against which you will be able to draw in respect of these expenses, and would like you to account to us for such drawings on a monthly basis.

8. It is clearly understood by both sides:-

(a) that in these terms you become a consultant of BOC and not an employee

(b) that you are not required under these terms to take up residence anywhere other than in the US.

This means that you are not entitled to benefit under BOC's pension or welfare schemes; it also means that we are not bound to make deductions for tax or pension from the remittances which we shall be making to you.

It is very much hoped that the above terms will be acceptable to you, in which case perhaps you will sign the acknowledgment at the foot of the duplicate copy of this letter and return it to me.

I have no doubt Dr Gross will be writing to you personally in order to convey his good wishes.

Yours sincerely,

CABL

(C.A.B.Leslie)
Secretary

Dr Albert Muller,
168 Valley Road,
Watchung,
New Jersey 07060
U S A.

Date April 30 1968

To: Secretary,
The British Oxygen Company Limited.

I acknowledge receipt of letter dated 25 April 1968, of which this is a copy, and hereby confirm my acceptance of the terms set out.

Yours truly,

Albert Muller

A 4285 EX-112-A

Copy - Mr J.M. Williams

Still Hollow Road
Lebanon, N.J. 08833
U.S.A.
March 20, 1970

L. E. S.
1 APR 1970

Mr. L.E. Smith
The British Oxygen Co., Ltd.
Hammersmith House
London, W.6.
ENGLAND

Dear Leslie:

This letter will confirm our recent discussions in New York regarding further consulting work for British Oxygen subsequent to the expiration of my current contract.

In view of your desire not to engage me on a retainer contract until your plans for the U.S. are fully crystallized, I am prepared to undertake spot assignments upon request in accordance with the following terms and conditions. My current fee for consultation is $335 per day. Billings for service will also include reimbursement for reasonable expenses incurred in connection with a given assignment, including travel, communications, secretarial service and other miscellaneous charges that may be incurred. I shall attempt to adjust my schedule to accommodate BOC, however, this may not always be possible due to other commitments.

It is my further understanding that BOC imposes no restrictions with respect to my employment by others, including the requirement to identify such organizations to BOC. With regard to your normal commercial and industrial rights, these will be limited to maintaining in confidence any information about BOC and its activities which is specifically transmitted to me during any assignment for a period of five years or public disclosure, whichever occurs first.

In addition to the above, I also should like to confirm the understanding we reached with respect to my acting as an independent broker in bringing to your attention from time to time potential commercial opportunities involving mergers, acquisitions, joint ventures or licensing arrangements. In the event any of these proves of interest to BOC, it is to be understood that I shall be entitled to the regular finder's fee involved.

March 20, 1970

Recently, I have received requests for assistance from Dr. Gardner and Mr. Blackmore in connection with their forthcoming visits to the U.S. in April. I have undertaken to make arrangements for these visits on the premise that the arrangements outlined above are satisfactory.

My final invoice for consulting service under the current contract is attached, together with an invoice for expenses for the current period. I have credited the $1,500 advance I have held against the amount now due as a consulting fee. Unless I hear from you further, I am assuming that activity under our current contract is terminated effective with the submission of these invoices.

It was a pleasure to meet with you in New York and I am hopeful that we can renew meaningful activity in the U.S. later this year.

Kindest personal regards,

Very sincerely yours,

Albert Muller

Albert Muller

AM/tk
Encs.

P.S. I expect to be in London in mid April and will telephone you regarding the above.

▲ 4287

CX-113

Mr. L. E. Smith
Mr. J. A. Perham
Mr. C.A.B. Leslie

C.A.B.L.
22 APR 1970

21 April, 1970
JMW/HFJ

Dr. A. Muller
Still Hollow Road,
Lebanon, N.J. 08833,
USA

Dear Al,

I am writing to record the nub of our conversation last Thursday.

We are happy that you are agreeable to undertake spot assignments for BOC on the terms indicated in your letter of 20 March.

We are arranging that all requests for such help come to you through the Chief Executives here in the UK, or from Allan Perham, and that in all cases a copy of the request reaches me.

It would make it easier for us to review progress of this work if you could keep me informed from time to time of the execution of the various requests reaching you.

Our discussions last Thursday touched on two other points:

Firstly, we understand that our arrangement does not entitle us to any information on other consultancies which you may from time to time take on, but we are sure that our relationship is such that business and technical information belonging to BOC will be kept properly confidential and that substantial conflicts of interest will be avoided.

The second point concerned payment of finder's fee in the case of possible acquisition. We understand from you that there is a normal scale for such a fee in USA and, further, that it is payable by the vendor of the business. And, further, again, that in the case of a complex situation such as would probably develop the fee would be split among the various introducing parties.

It was good to see you again here in London and I am sure we can arrange to meet later in the year to review progress in the new style of things.

Yours sincerely,

(J. M. Williams)

A 4288

Ex-114

from J. M. Williams

to CE GASES
CE WELDING PRODUCTS
CE FOOD SERVICES
CE CHEMICALS
CE ADVANCED ENGINEERING
DR J. B. GARDNER
MR H. S. RICH

date 22 April, 1970

our ref

Copy/courier Mr J. D. Smith
Mr P. Leister
Mr R.C.Hesketh-Jones
Mr J. A. Perham
Mr C. A. B. Leslie

DR A. MULLER

Dr Muller has been retained by BOC as a consultant for two years. This consultancy has been terminated with effect from 1 April 1970, but Dr Muller is prepared to undertake spot assignments for us on request.

His terms are:

1 $335 per day.

2 Billings for service will also include reimbursement for reasonable expenses.

3 BOC imposes no restrictions on his employment by others; nor are we entitled to require him to identify such organisations to BOC.

4 Dr Muller will maintain in confidence any information about BOC and its activities specifically transmitted to him for a period of five years or public disclosure, whichever occurs first.

Dr Muller will also act as an independent broker in the case of businesses which may be offered to us for purchase and in those cases where the initiative is taken by him he will be due the normal finder's fee. This is by custom paid by the seller.

In order to control the flow of specific requests to Dr Muller, could I ask that these go over your signature always with a copy to myself.

The relationship set up with Dr Muller is an open-ended one which we will review in twelve months' time.

Any questions on how it should operate, to me, please.

A 4289

Burdett Gas.

August 17, 1971

AIR MAIL

CX-115-A

Mr. John M. Williams
Managing Director
The British Oxygen Company Limited
Hammersmith House London W6
England

Dear Mr. Williams:

Thank you for allowing me to infiltrate your busy schedule. I am sure the session will be mutually beneficial.

Estimated Sales of those companies referred to are as (1971 projected) follows:

Burdett Oxygen Company	$ 3,500,000
Burdett Oxygen Company of Syracuse, Inc.	720,000
Keystone Cylinder Gas Corp.	480,000
Narox Inc.	840,000
Welders Engineering Research Corporation	3,000,000

The last of this group is a buying and warehousing operation and I am quite sure would be of no interest to B. O. C. The others are basic manufacturing and distribution companies with sales of gases accounting for 70% of sales.

Superior Air Products, a small plant manufacturer, would also be interested in going with the arrangement; their sales, approximately 2.5 million.

I am firmly convinced that Odda could provide us with a satisfactory arrangement on Carbide and hope they pursue their expansion program.

continued

A 4290

CX-115-B

Please let me know when we might discuss this matter further.

Very truly yours,

CDLP:cdf

A 4291

The British Oxygen Company Limited

Hammersmith House, London W6
Telephone 01-748 2020
Telegrams Boxoxygen, London W6
Telex 22833

SEP 10 1971

C.D.P.	FILE	COPIES
REFER TO		F. U.

Mr C.D.L. Perkins
Burdett Oxygen Company
1 Schuylkill Avenue
Norristown,
Penna. 19404,
USA

6 September 1971

CX-116

Dear Mr Perkins,

Thank you for your letter of August 17 and for the figures.

I confess that I was somewhat disappointed at the sales volumes you list for the Companies in your Group but was particularly interested in the reference to Superior Air Products as also being potentially interested. I am asking the Chief Executive of BOC's Gases Division, Mr D.W.N. Pitts, to arrange with you for one of his executives, Mr Ian Temple-Roberts, to visit you in Philadelphia and assess our possible interest.

Yours sincerely,

J. M. WILLIAMS

From John Williams, Managing Director

Great West House,
Great West Road, Brentford, Middlesex
Telephone 01-560 5166
Telex 24981
Telegrams Britoxygen Hounslow

A 42:12

CC
11-23
CX-117

PERSONAL AND CONFIDENTIAL.

Mr C.D.L. Perkins,
Burdett Oxygen Company,
1, Schuylkill Avenue,
Norristown,
Penna. 19404. U.S.A.

16 November 1971

Dear Chill,

It has taken some time and real consideration (and I have been in Europe again) to come to a reasonable decision on your suggestions. It is that we should continue to review with you the opportunity offered as long as you would wish but that, at this time, we should not try to commit ourselves to the sequence of investments we discussed.

There are two main reasons for this decision, which I trust you will understand. The first has to do with that longer term position in the U.S.A. which would face us in, say, five years after a successful pursuit of the lines proposed. We have no wish to be minor and vulnerable participants in a market and we do not see with sufficient certainty what strengths we would possess either in marketing or money terms. The second is the need in the immediate future to concentrate our focus on the new European opportunities which are already demanding much management time.

We are aware of the sort of profits which can be made in the U.S. market and are keenly interested to improve this awareness. This would help clear the longer view.

Your offer to come over to bring more details about Burdett Oxygen is appreciated, but we believe brings us too soon to details which could not be resolved without agreement on the longer view.

We should be glad to know how you see the situation in the light of our decision. I believe that we should seek some way to help both our interests.

Again, please accept our thanks for the frank way in which you have presented your views. I shall look forward to hearing from you and, I trust, to continuing a useful dialogue.

My best wishes to all your people and sincere regards to KP and yourself.

I. Temple Roberts.

P.S. I hope you received my earlier letter and the photographs.

A 4293

CX-118

PAUL, WEISS, RIFKIND, WHARTON & GARRISON
345 PARK AVENUE
NEW YORK, N.Y. 10022

TELEPHONE (212) 935-8000
TELECOPIER (212) 935-8302

CABLE LONGSIGHT N.Y.
TELEX 12-7931

RANSOM H. PAUL (1946-1959)
LOUIS S. WEISS (1927-1950)

JOHN F. WHARTON
LLOYD K. GARRISON
ROBERT F. SAMUELS
COUNSEL

WASHINGTON OFFICE
1775 K STREET, N.W.
WASHINGTON, D.C. 20006
TELEPHONE 202 293-6370
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WRITER'S DIRECT DIAL NUMBER

(212) 935-8702

SIMON H. RIFKIND
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MORRIS B. ABRAM
MORDECAI ROCHLIN
PAUL J. KENLON
JOSEPH S. IRVIN
JAMES D. LEWIS
THEODORE C. SORENSEN
MARTIN KLEINBARD
RICHARD H. PAUL
NORMAN TELLER
JOHN E. MASSENDALE
JAY H. TOPPIS
EDWARD N. COSTIKYAN
ROBERT H. MONTGOMERY, JR.
JOHN C. TAYLOR, JR.
BERNARD H. GREENE
ERNEST RUBENSTEIN
ALLAN B. ECKER
STUART ROSENWITZ
JAMES L. PURCELL
ARTHUR KALISH
DAVID T. WASHBURN
BERNARD FINKELSTEIN
ARTHUR L. LIMAN
RICHARD R. DAVIDSON
SEYMOUR HERTZ
WALTER F. LEINHARDT
GERALD D. STERN
ANTHONY B. KRALIN
MARTIN LONDON
DAVID C. BROADHEAD
PETER R. HAJE
LEONARD V. QUIGLEY
ALLAN BLUMSTEIN
NEALE M. ALBERT
JAY GREENFIELD
KEVIN J. O'BRIEN
ALFRED D. YOUNGWOOD
DONALD F. HOOF
JOSEPH E. BROWDY
SIDNEY S. ROSDEITCHER
ROBERT L. LAUFER
ALLEN L. THOMAS
PETER L. FELCHER
MARK H. ALCOTT
JOHN P. MCENROE
PETER J. ROTHENBERG

February 1, 1974

Gordon Youngwood, Esq.
Federal Trade Commission
425 13 Street, N.W.
Room 932
Washington, D. C.

File No. 7410005

Dear Mr. Youngwood:

Our client informs us that sales in the United States by BOC-Airco during the period of the joint venture were as follows:

Oct. 1967 - Sept. 1968	£107,653
Oct. 1968 - Sept. 1969	£595,203
Oct. 1969 - Sept. 1970	£543,866
Oct. 1970 - Sept. 1971	£371,360

The only U.S. customer to whom cold boxes were sold in the United States from October 1971 to date is Airco-Cryoplants, the successor company of the joint venture.

I shall try to supply you with the information you requested last week concerning Harris Lake and Fraser Sweatman as soon as possible.

Cordially,

Peter F. Gold

Peter F. Gold

PFG:iab

AIRMAIL - SPECIAL DELIVERY - RETURN RECEIPT REQUESTED

A 4294

CX-131-A

ALBERT MULLER
Still Hollow Road
Lebanon, N. J. 08833
U. S. A.

February 20, 1970

Mr. N. F. J. Reckitt
The British Oxygen Company Limited
North Circular Road
Cricklewood, London NW2
England

Dear Norman:

This will acknowledge and thank you for your letter of February 6th regarding Vibramatic. I have discussed this further with Mr. Berryman and suggested to him that he deal with you directly on this subject.

As an aftermath of Mr. Greenfield's recent visit, I have had further discussions with several major distributors of gases and welding products in the New York area. During the course of these discussions I learned that AGA is attempting to introduce their line of equipment into the United States on a fairly aggressive basis. They have offered the usual assortment of regulators, flowmeters, torches and other devices to distributors in the New York area at attractive prices. Apparently these distributors have considered interest in this line since it is well constructed and attractively priced.

One situation I should like to report in more detail. Mr. Harry Elliott, one of the owners of Cro-dyne, Bridgeport, Connecticut, called me about a week ago and asked whether or not British Oxygen had gas regulators and flowmeters equipment available which could be employed in the electronics industry and which would insure that the various gases and gas mixtures which the electronics fabricators use, would be less susceptible to contamination than the readily available apparatus developed for the welding trade. Elliott purchased a 50% interest in Seaburg Welding Supply in 1955 after having spent many years with Air Reduction. He called me because I have known him for 25 years and he knew that I was engaged in work for BOC. In the period since 1955, Seaburg Welding has acquired three other major distributorships in the New York and lower New England area. They sell a little over $2-million worth of goods yearly and are one of the largest distributors of gases and hard goods in the New England area.

My purpose in reporting this is to indicate again that there appears to be an opportunity for you to sell certain hard goods in the US if you will adjust the

EX-121-8

February 20, 1970

design of this equipment to reflect the requirements of the market. The New England area contains a fairly large concentration of companies who process electronic components and in this activity employ many gases which have to be controlled with a precision that goes beyond that possible with the conventional regulators and metering devices. The avoidance of contamination is particularly important in operations involving solid state elements such as transistors and the piping systems for gases to the production areas are causing difficulties at present.

I do not know what your reaction will be to this specific situation but would appreciate hearing from you in this regard.

Sincerely yours,

Albert Muller

AM/tk

cc: Mr. Leslie E. Smith
Mr. R. C. Hesketh-Jones
Mr. J.A. Perham

BEST COPY AVAILABLE

A 4296

EX-122-A

ALBERT MULLER
Still Hollow Road
Lebanon, New Jersey 98333
U.S.A.

January 20, 1970

Mr. L.E. Smith
The British Oxygen Co., Ltd.
Hammersmith House
London, W. 6, England

Dear Leslie:

In the current reporting period, primary attention has been given the matter of assembling data and analysing the current posture of the industrial gas industry in the U.S. This activity has included numerous "off-the-record" conversations with individuals presently employed in this industry and with others recently employed by the major producers. Since this information is currently being reviewed with Messrs. Perham and Greenfield, I shall not attempt to report in this letter, except to mention the fact that a major change in the corporate make-up of the industry appears likely.

Invoices for my expenses for the period December 16, 1969 to January 15, 1970, inclusive, are enclosed.

Very sincerely yours,

Albert Muller

AM/tk
Encs.

A 4297

CX-122-B

To: The British Oxygen Co., Ltd.
Hammersmith House
London, W. 6, England

From: A. Muller
Still Hollow Road
Lebanon, New Jersey 03833, U.S.A.

January 19, 1970

Consulting Fee for January 1970 . . . $2,750.00

[illegible]	$ 331.06
Telephone and Telecommunications	121.49
Part time Secretarial Service	34.00
Miscellaneous, office supplies	33.23
[illegible] A. Muller	$ 319.81

[illegible]

A 42:8

CX-122-C

To: The British Oxygen Co., Ltd.
Hammersmith House
London, W.6, England

From: Albert Muller
Still Hollow Road
Lebanon, New Jersey 08833 U.S.A.

January 19, 1970

Expenses for period December 16, 1969
to January 15, 1970, inclusive

Travel	$ 386.06
Telephone and Communications	121.40 [1]
Part time Secretarial Service	54.90
Miscellaneous, office supplies	63.25 [2]
Total	$625.61

1) Includes 2 telephone calls; 3 cables to London
2) Includes Dept. of Commerce Publications ($26.25)

A 4299

Ex-125-A

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

SCHEDULE 13D

Filed pursuant to Rule 14d-1 under
the Securities Exchange Act of 1934

BOC Financial Corporation
306 South State Street
Dover, Delaware 19901

Ex-125-B

Item 1. Security and Issuer.

The class of securities to which this statement relates is the common shares, $1 par value (the "Shares"), of Airco, Inc., a New York corporation ("Airco"), the address of which is 85 Chestnut Ridge Road, Montvale, New Jersey 07645.

Item 2. Identity and Background.

(a) The name and business address of the person filing this statement are BOC Financial Corporation (the "Purchaser"), 306 South State Street, Dover, Delaware.

(b) Inapplicable.

(c) The Purchaser, a Delaware corporation, was organized solely for the purpose of the offer for Shares to which this statement relates, and has engaged in no business prior to the date hereof except in connection with said offer.

(d) The name, residence address, business address and certain biographical data of each officer and director of the Purchaser are set forth in Exhibit A.

(e) Neither the Purchaser nor, to its knowledge, any officer or director of the Purchaser, has during the last 10 years been convicted in a criminal proceeding, excluding traffic violations or similar misdemeanors.

The Purchaser's common stock is owned by BOC Holdings Limited, a United Kingdom company ("Holdings"). The following information is submitted with respect to Holdings:

(a) The business address of Holdings is Hammersmith House, London W6, England.

(b) Inapplicable.

(c) Holdings is engaged in holding various securities of subsidiaries (direct or indirect) of The British Oxygen Company Limited, a United Kingdom company ("BOC").

(d) The name, residence address, business address and certain biographical data of each officer and director of Holdings are set forth in Exhibit B.

(e) Neither Holdings nor, to its knowledge, any officer or director of Holdings, has during the last 10 years been convicted in a criminal proceeding, excluding traffic violations or similar misdemeanors.

The outstanding ordinary shares of Holdings are held by British Oxygen Investments Limited ("Investments"), a United Kingdom company.

The following information is submitted with respect to Investments:

EX-125-D

(a) The business address of Investments is Hammersmith House, London W6, England.

(b) Inapplicable.

(c) Investments is engaged in holding various securities of subsidiaries (direct or indirect) of BOC.

(d) The name, residence address, business address and certain biographical data of each officer and director of Investments are set forth in Exhibit C.

(e) Neither Investments nor, to its knowledge, any officer or director of Investments, has during the last 10 years been convicted in a criminal proceeding, excluding traffic violations or similar misdemeanors.

Investments is a wholly-owned subsidiary of BOC. The following information is submitted with respect to BOC:

(a) The business address of BOC is Hammersmith House, London W6, England.

(b) Inapplicable.

(c) BOC, the ordinary shares of which are traded on The Stock Exchange in London, is engaged in the manufacture of industrial, medical and rare gases, welding equipment, special metals, air separation equipment, medical equipment, aircraft breathing systems, cryogenic systems and equipment,

vacuum equipment and instrumentation, and food products. BOC's Annual Report for its fiscal year ended September 30, 1972, is attached as Appendix 1.

(d) The name, residence address, business address and certain biographical data of each officer and director of BOC are set forth in Exhibit D.

(e) Neither BOC nor, to its knowledge, any officer or director of BOC, has during the last 10 years been convicted in a criminal proceeding, excluding traffic violations or similar misdemeanors.

Item 3. Source and Amount of Funds or Other Consideration.

To pay for its purchase of Shares and related expenses, Purchaser intends to obtain an aggregate sum of up to $72,000,000, as follows:

Investments has obtained commitments for a commitment fee of 1/2 of 1% pursuant to which it may borrow an aggregate of $72,000,000 from two United Kingdom banks and four United Kingdom branches of United States banks under 7-year loans bearing interest at a rate of 3/4 of 1% above the London inter-bank rate for Euro-dollars in effect from time to time. Principal of such loans will be repayable during the sixth and seventh years in five equal semi-annual installments. Such loans may be prepaid at any time and will be

guaranteed by BOC; the loans and guaranties will be unsecured. Investments will lend the proceeds of such loans to Holdings, which will use them to acquire all of Purchaser's common stock.

Item 4. Purpose of Transaction.

The purpose of the offer to which this statement relates is to allow the Purchaser to acquire a significant holding in Airco such that BOC will be able to influence and participate in the development of Airco policy and business strategy. Thus, if the Purchaser obtains a significant shareholding, BOC intends to exercise this influence and participation through representation on Airco's Board of Directors. Airco has agreed that if BOC holds or owns, directly or indirectly, 1,000,000 or more Shares, it will elect to the Airco Board of Directors, and at future meetings of Airco shareholders it will nominate for election to Airco's Board of Directors, such number of representatives of BOC as will represen approximately the same percentage of the Airco directors as the Purchaser's holdings represent of the Shares. If BOC directly or indirectly acquires more than 2,400,000 Shares, the BOC Board of Directors has the intention of inviting George S. Dillon and Richard Giordano to become members of the BOC Board of Directors.

Neither the Purchaser, Holdings, Investments nor BOC (Holdings, Investments and BOC being hereinafter referred to collectively as the "Purchaser's Parents") has any plans or proposals to liquidate Airco, to sell Airco's assets or to merge it with any

other persons, or to make any other major change in its business or corporate structure. BOC would expect to work with Airco in considering the businesses in which Airco is engaged. No plans, proposals or changes would be undertaken without the mutual consent of the Airco Board of Directors and the BOC Board of Directors. Such actions might in the usual course of events require the approval of more Shares than would be owned by the Purchaser.

It is possible that at a future date not yet determina the Purchaser will formulate and make proposals to the Airco Boa of Directors to acquire additional interests in Airco.

Item 5, Interest in Securities of the Issuer.

Neither Purchaser nor any of Purchaser's Parents, and to the best of the Purchaser's knowledge, no officer or director of the Purchaser or of any of Purchaser's Parents and no associat of the Purchaser or of any of Purchaser's Parents or of any such officer or director, owns, or has a right to acquire, directly or indirectly, any Shares. No transactions in Shares were effected during the past 60 days by the Purchaser or any of Purchaser's Parents or, to the best of the Purchaser's knowledge, by any officer, director or affiliated person of the Purchaser or of any of Purchaser's Parents, by any subsidiary of the Purchaser or of any of Purchaser's Parents, or by any officer, director or affiliated person of any such subsidiary.

Item 6. Contracts, Arrangements or Understandings with Respect to Securities of the Issuer.

In connection with the decision by BOC and Airco to study the feasibility of establishing closer relationships, they entered into an agreement dated July 25, 1973, pursuant to which they have agreed to exchange confidential data regarding their respective businesses. Each party agreed not to use any of such information for commercial purposes without the written consent of the other party and that without such consent neither party would make, or authorize or permit any of its affiliates to make, a tender, exchange or other offer for any securities of the other until July 25, 1978. BOC has not received pursuant to such agreement any confidential information of a material nature. The Board of Directors of Airco has approved the Offer as required by such agreement.

BOC and Airco have modified the agreement so that, if any person, without BOC's prior acquiescence, acquires 20% of the Shares, or hereafter files with the Commission materials required in order to acquire or to make an offer to acquire Shares which would bring the aggregate of such person's holding of Shares to 15% or more of the Shares, then the agreement between BOC and Airco of July 25, 1973, shall, to the extent it would limit BOC's right to make a tender, exchange or other offer, cease to be applicable. Such modification also provides that if Purchaser should in the future decide to dispose of its Shares, which it does not presently contemplate, it will first offer them to Airco.

Except as set forth in the preceding paragraphs of this Item 6 and in Item 7 hereof, neither the Purchaser nor any of Purchaser's Parents, and no director or officer of the Purchaser or of any of Purchaser's Parents, has any contracts, arrangements or understandings with any person with respect to any securities of Airco, including but not limited to transfer of any of the securities.

Item 7. Persons Retained, Employed or to be Compensated.

The Purchaser will pay to any broker or dealer (including the Dealer Manager) that is a member of a national securities exchange or of the National Association of Securities Dealers, Inc., or to any foreign broker or dealer that agrees to conform to the Rules of Fair Practice of such Association in soliciting acceptances in the United States, or to any commercial bank or trust company the name of which appears in the appropriate space in the Letter of Transmittal the form of which is annexed as Exhibit 2 ("Soliciting Dealers"), a solicitation fee of $.50 for each Share purchased hereunder. No Soliciting Dealer shall be the agent of the Purchaser, the Dealer Manager, or the Depositary for purposes of the Offer.

Lazard Freres & Co., One Rockefeller Plaza, New York, New York 10020, will act as Dealer Manager for the Purchaser in connection with the offer to which this statement relates.

The Dealer Manager will receive a fee of $.15 (in addition to any fees received by it as Soliciting Dealer) for each Share so purchased, with a minimum fee of $100,000 whether or not any Shares are purchased; will be reimbursed by the Purchaser for its reasonable out-of-pocket expenses; and will be indemnified by the Purchaser against certain civil liabilities in connection with the Offer.

First National City Bank is to serve as Depositary in connection with the offer to which this statement relates. The Purchaser will pay such bank reasonable and customary compensation for such services and will reimburse it for the reasonable out-of-pocket expenses incurred by it as Depositary.

The Kissel-Blake Organization, Inc. has been retained by the Purchaser to aid in soliciting acceptances of the offer to which this statement relates. The Purchaser will pay such firm reasonable and customary compensation for such services and will reimburse it for the reasonable out-of-pocket expenses incurred by it as Soliciting Agent.

Item 8. Material to be Filed as Exhibits.

(1) Draft of Letter from Airco transmitting the Offer to Purchase.

(2) Copy of Offer to Purchase.

(3) Copy of Letter of Transmittal.

SX-125-K

(4) Copy of letter from Lazard Freres & Co. to Brokers, Dealers, Banks, Trust Companies and Nominees.

(5) Copy of Letter from Brokers, Dealers, Banks, Trust Companies and Nominees to Their Clients.

(6) Text of Press Release.

A 4310

tx-125-L

SIGNATURE

I certify that to the best of my knowledge and belief the information set forth in this statement is true, complete and correct.

BOC FINANCIAL CORPORATION

By _____
Paul G. Bosonnet
Vice President

December 10, 1973

EXHIBIT A

Name and Residence Address	Position with Purchaser And Other Principal Occupation or Business; Principal Occupation of any such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Paul Graham Bosonnet, 7 Bakeroft Close, West Byfleet, Surrey, England	See Exhibit C	See Exhibit C
Adrian W. DeWind, 37 West 12th Street, New York, New York 10011	President and Director, Purchaser; Partner, Paul, Weiss, Rifkind, Wharton & Garrison, 345 Park Avenue, New York, New York 10022 (law firm)	President and Director, Purchaser, from December 1973 to date; Partner, Paul, Weiss, Rifkind, Wharton & Garrison, 345 Park Avenue, New York, New York 10022, from January 1948 to date (law firm)
Steven P. Dolberg, 11 Montague Terrace, Brooklyn, New York 11201	Secretary, Purchaser; Attorney, Paul, Weiss, Rifkind, Wharton & Garrison, 345 Park Avenue, New York, New York 10022 (law firm)	Secretary, Purchaser, from December 19 to date; Attorney, Paul, Weiss, Rifkir Wharton & Garrison, 345 Park Avenue, New York, New York 10022, from August 1969 to date (law firm); Law Clerk, to the Honorable Paul R. Hays, United States Circuit Judge, United States Courthouse, Foley Square, New York, New York 10007, from September 1968 through August 1969; Student for more than five years prior thereto
John E. Massengale, Goodwives River Road, Moreton, Conn. 06820	Director, Purchaser; Partner, Paul, Weiss, Rifkind, Wharton & Garrison, 345 Park Avenue, New York, New York 10022 (law firm)	Director, Purchaser, from December 1973 to date; Partner, Paul, Weiss, Rifkind, Wharton & Garrison, 345 Park Avenue, New York, New York 10022 from January 1958 to date (law firm

4-51-XC

EXHIBIT B

Name and Residence Address	Position with Holdings and Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years of More Including the Name, Principal Business and Address of Each Such Occupation
Paul Graham Bosonnet, 7 Ockeroft Close, West Byfleet, Surrey, England	See Exhibit C	See Exhibit C
Robert Christopher Hesketh-Jones, 213 Castelnau, London SW13, 9FL, England	See Exhibit D	See Exhibit D
Ronald Charles Hill, 62 Aldebury Road, Maidenhead, Berkshire, England	See Exhibit C	See Exhibit C
Colin Alan Bettridge Leslie, Kerves Brook, Kerves Lane, Horsham, Sussex, England	See Exhibit D	See Exhibit D
Leslie Edward Smith, St. Nicholas Farmhouse, Dunt Lane, Hurst, North Reading, Berkshire England	See Exhibit D	See Exhibit D

CX-1252

A 4312

EXHIBIT C

Name and Residence Address	Position with Investments And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Paul Graham Bosonett, 7 Cakeroft Close, West Byfleet, Surrey, England	Director, Investments; Director of Group Strategy, BOC; Director, Holdings; Director and Vice-President, Purchaser; Director, Tonnox Construction Limited, Hammersmith House, London W6, England (development and supply of plant for manufacture of industrial gases); Director, BOC Deutschland GmbH, 565 Solingen, Grafrath, Schulstrasse 14, West Germany (holding company); Director, British Oxygen Finance BV, c/o De Grauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands (finance company); Director, Normineral Holding BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands (holding company)	Director, Investments, from June 1973 to date; Director of Group Strategy, BOC, from May 1973 to date; Director Holdings, from June 1973 to date; Director and Vice-President, Purchaser, from December 1973 to date; Director, Tonnox Construction Limited, Hammersmith House, London W6, England, from June 1973 to date (development and supply of plant for manufacture of industrial gases); Director, BOC Deutschland GmbH, 565 Solingen, Grafrath, Schulstrasse 14, West Germany from August 1973 to date (holding company); Director, British Oxygen Finance BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands, from July 1973 to date (finance company); Director Normineral Holding BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands, from July 1973 to date (holding company); Chief Executive, Welding Products Division, BOC, from November 1972 to April 1973; Deputy Chief Executive, Gases Division, BOC, from April 1971 to October 1972; Regional Controller, Southern Region, Gases Division, BOC, from March 1967 to May 1967; Financial Services Manager, BOC, from October 1966 to March 1967; Divisional Accountant, Equipment Division, BOC from October 1962 to October 1966;

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Name and Residence Address	Position With Investments And Other Principal Occupation or Business; Principal Business of any such Company and Business Address	Material Occupations During the Last Ten Years or more Including The Name, Principal Business and Address of Each Such Occupation
		Director, Anglian Industrial Gases Limited, Hammersmith House London W6, England, from May 1967 to June 1973 (BOC subsidiary); Director, Seaflame Company Limited, Hammersmith House, London W6, England, from January 1971 to November 1972 (BOC subsidiary).
Robert Christopher Becketh-Jones, 113 Castelnau, London SW13 9EL, England	See Exhibit D	See Exhibit D
Ronald Charles Hill, 62 Aldebury Road, Tilehurst, Berkshire, England	Secretary, Investments, Internal Registrar, BOC; Company Secretary, Holdings;	Secretary, Investments, from January 1972 to date; Internal Registrar, BOC, from December 1961 to date; Company Secretary, Holdings, from February 1973 to date.
Colin Alan Bettridge Leslie, Kerves Brook, Kerves Lane, Horsham, Sussex, England	See Exhibit D	See Exhibit D
Leslie Edward Smith, St. Nicholas Farmhouse, East Lane, Hurst, Near Reading, Berkshire, England	See Exhibit D	See Exhibit D

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EXHIBIT D

Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Sir John Guise Cowley CC, KBE, CB, Whitemoor Sandy Down, Boldre, North Lymington, Hampshire, England	Director, BOC; Director, Keith & Henderson Limited, 5-6 Yarnmouth Place, London W1, England (property company)	Director, BOC, from February 1962 to date; Director, Keith & Henderson Limited, 5-6 Yarnmouth Place, London W1, England, from November 1972 to date (property company); Director, Prenbrook Limited, Bush Lane House, Bush Lane, London EC4, England, from March 1963 to June 1971; Director, Wilverley Securities Limited, 5-6 Yarnmouth Place, London W1, England, from October 1970 to January 1973 (property company); Director, C.T. Bowring & Co. Limited, The Bowring Building, Tower Place, London EC3, England, from March 1969 to August 1971 (insurance company); Director, Bowmaker Limited, 55 St. James's Street, London SW1, England, from February 1962 to August 1971 (bankers); Director, Bowmaker (Plant) Limited, 55 St. James's Street, London SW1, England, from June 1962 to August 1971 (leasing and financing company); Director, Bowmaker Finance (Zambia) Limited, c/o 55 St. James's Street, London SW1, England, from August 1964 to August 1971 (leasing and financing company); Director, British Malayan Pineapple (Marketing)

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ame and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
		Company Limited, c/o Bush Lane House, Bush Lane, London EC4, England, from October 1967 to December 1971 (importers of fruits);Director, Tawrotor Lansing Limited, c/o Lansing Bagnall Limited, Basingstoke, Hampshire, England, from March 1962 to July 1964 (manufacturers of fork-lift trucks); Director, Telemeter House Viewing Limited, c/o Bowmaker Limited, Bowmaker House, Christchurch Road, Bournemouth, Hampshire, England, from June 1964 to June 1969 (provision of 'television-type' entertainment in the home).
r Geoffrey Cecil ve: Eley, CBE, Wynnstay Gardens, len Street, noon W8 6UR, gland	Vice Chairman, BOC; Chairman, Thomas Tilling Limited, Crewe House, Curzon Street, London W1Y 8AX, England (industrial holding company); Chairman, Heinemann Group of Publishers, 15 Queen Street, London W1, England (publishers); Deputy Chairman, British Bank of the Middle East, 20 Abchurch Lane, London EC4, England (bank); Director, Equity & Law Life Assurance Society Limited,	Vice Chairman, BOC, from May 1964 to date; Chairman, Thomas Tilling Limited, Crewe House, Curzon Street, London W1Y 8AX, England, from January 1965 to date (industrial holding company); Chairman, Heinemann Group of Publishers, 15 Queen Street, London W1, England, from December 1968 to date (publishers); Deputy Chairman, British Bank of the Middle East, 20 Abchurch Lane, London EC4, England, from September 1952 to date (bank); Director, Equity & Law Life

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Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Organization
Samuel Charles, Lord Elworthy, GCB, CBE, DSO, MVO, DSC, AFC, Norman Tower, Windsor Castle, Berkshire, England	Director, BOC; Governor of Windsor Castle, Windsor Castle, Berkshire, England; Lord Lieutenant of Greater London, County Hall, London SE1, England; Director, The British Petroleum Company Limited, Britannic House, Moor Lane, London EC2, England (holding company); Director, The Plessey Company Limited, 2-60 Vicarage Lane, Ilford, Essex, England (manufacturers of electronic equipment); Director, The National Bank of New Zealand, 8 Moorgate, London EC2, England (bank); Director, Rolls Royce (1971) Limited, Conduit Street, London W1, England (manufacturers of aero engines); Director, Scientific Control Systems Holdings Limited, Sanderson House, Berners Street, London W1, England (holding company); Regional Director, Central London Regional Board of Lloyds Bank Limited, 71 Lombard	Director, BOC, from May 1971 to date; Governor of Windsor Castle, Windsor Castle, Berkshire, England, from May 1971 to date; Lord Lieutenant of Greater London, County Hall, London SE1, England, from September 1973 to date; Director, The British Petroleum Company Limited, Britannic House, Moor Lane, London EC2, England, from May 1971 to date (holding company); Director, The Plessey Company Limited, 2-60 Vicarage Lane, Ilford, Essex, England, from May 1971 to date (manufacturers of electronic equipment); Director, The National Bank of New Zealand, 8 Moorgate, London EC2, England, from April 1971 to date (bank); Director, Rolls Royce (1971) Limited, Conduit Street, London W1, England, from February 1971 to date (manufacturers of aero engines); Director, Scientific Control Systems Holdings Limited, Sanderson House, Berners Street, London W1, England, from October 1972 to date (holding company); Regional Director, Central

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Name of Business Reference	Position with BOC And Other Principal Occupation or Employment; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Sam James Fraser, [illegible], [illegible], 29 Eaton Square, London SW1, England	Director, BOC; Deputy Chairman, Lazard Brothers & Co. Ltd., 11 Old Broad Street, London, EC2P 2HT England (merchant bankers); Director, The Whitehall Trust Limited, 10 Old Broad Street, London EC2P 2HT England (investment trust); Director, Davy International Limited, 15 Portland Place, London W1, England (engineering company); Part time member, Civil Aviation Authority, 129 Kingsway, London WC2, England (British Government regulatory body); Chairman, Rolls-Royce Motors Limited, Pym's Lane, Crewe, Cheshire, England (manufacturers of motor cars).	Director, BOC, from April 1972 to date; Deputy Chairman, Lazard Brothers & Co. Ltd. 11 Old Broad Street, London EC2P 2HT England, from July 1972 to date (merchant bankers); Director, The Whitehall Trust Limited, 10 Old Broad Street, London EC2P 2HT England, from June 1973 to date (investment trust); Director, Davy International Limited, 15 Portland Place, London W1, England, from July 1972 to date (engineering company); Part time member, Civil Aviation Authority, 129 Kingsway, London WC2, England, from April 1972 to date (British Government regulatory body); Chairman, Rolls-Royce Motors Limited, Pym's Lane, Crewe, Cheshire, England, from December 1972 to date (manufacturers of motor cars); Director-General, City Panel on Takeovers and Mergers, Stock Exchange Building, London EC2, from April 1969 to March 1972 (City of London's self-regulatory body); Director, S G Warburg & Co. Ltd., 30 Gresham Street, London EC2, from January 1962 to April 1969 (merchant bankers); Director, Wagon Finance Corporation Ltd., 3 Endcliffe Crescent, Sheffield 10, Yorkshire, England, from January 1963 to April 1969 (finance company); Director, Bosch Ltd., Rhodes Way, Watford, Hertfordshire, England, from January 1965 to April 1969 (electrical appliance manufacturers).

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Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Robert Christopher Hoskyns-Jones, 113 Castelnau, London SW13 9EL, England	Managing Director, BOC; Director, Investments; Director, Holdings; Director, British Oxygen (Far East) Limited, Hammersmith House, London W6, England (manufacturers of industrial and medical gases); Director, Canadian Oxygen Limited, 355 Horner Avnue, Toronto 14, Ontario, Canada (manufacturers of industrial and medical gases); Director, Ceylon Oxygen Limited, 50 Sri Pannananda Mawatha, Mutwal, Colombo 15, Sri Lanka, Ceylon (manufacturers of industrial and medical gases and equipment); Director, BOC Pensions Limited, Hammersmith House, London W6, England (pension fund); Director, British Oxygen (Hong Kong) Limited, Strath Nominees Limited, Prince's Building 22nd Floor, Hong Kong (holding company); Alternate director, The Commonwealth Industrial Gases. Limited, 46 Kippax Street, Surry Hills, New South Wales , Australia (manufacturers	Managing Director, BOC, from January 1970 to date; Director, Investments. from June 1973 to date; Director, Holdings, from September, 1969 to date; Director; British Oxygen (Far East) Limited, Hammersmith House, London W6, England, from April 1968 to date (manufacturers of industrial and medical gases); Director, Canadian Oxygen Limited, 355 Horner Avenue, Toronto 14, Ontario, Canada (manufacturers of industrial and medical gases); Director, Ceylon Oxygen Limited, 50 Sri Pannananda Mawatha, Mutwal, Colombo 15, Sri Lanka, Ceylon, from March 1970 to date (manufacturers of industrial and medical gases and equipment); Director, BOC Pensions Limited, Hammersmith House, London W6, England, from March 1972 to date (pension fund); Director, British Oxygen (Hong Kong) Limited, Strath Nominees Limited, Prince's Building, 22nd Floor, Hong Kong, from February 1972 to date (holding company); Alternate director, The Commonwealth Industrial Gases Limited, 46 Kippax Street, Surry Hills, New South Wales 2010, Australia, from December

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Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	of industrial and medical gases and equipment); Director, East African Oxygen Limited, Kilmarnock Road, PO Box 18010, Nairobi, Kenya (manufacturers of industrial and medical gases and equipment); Director, Electric Arc (Jamaica) Limited, Coopers & Lybrand, PO Box 267, Burroughs Building, 12-14 Oxford Terrace, Kingston 5, Jamaica (manufacturers of electric arc welding equipment); Director, Indian Oxygen Limited, Oxygen House, P-34 Taratala Road, Calcutta 700053, India (manufacturers of industrial and medical gases and equipment); Director, Malayan Oxygen Sendirian Berhad, 13 Jalan 222, Petaling Jaya, PO Box 633, Kuala Lumpur, Malaysia (manufacturers of industrial and medical gases and equipment); Director, Malayan Welding Products Sendirian Berhad, 13 Jalan 222, Petalin Jaya, PO Box 633, Kuala Lumpur, Malaysia (manufacturers of and dealers in welding electrodes machinery, tools, implements and appliances); Alternate director, New Zealand Industrial Gases [illegible] Road, Lower	1969 to date (manufacturers of industrial and medical gases and equipment); Director, East African Oxygen Limited, Kilmarnock Road, PO Box 18010 Nairobi, Kenya, from February 1971 to date (manufacturers of industrial and medical gases and equipment); Director, Electric Arc (Jamaica) Limited, Coopers & Lybrand, PO Box 267, Burroughs Building, 12-14 Oxford Terrace; Kingston 5, Jamaica, from November 1970 to date (manufacturers of of electric arc welding equipment); Director, Indian Oxygen Limited, Oxygen House, P-34 Taratala Road, Calcutta 70005, India, From September 1969 to date (manufacturers of industrial and medical gases and equipment); Director, Malayan Oxygen Sendirian Berhad, 13 Jalan 222, Petaling Jaya, PO Box 633, Kuala Lumpur, Malaysia, from July 1969 to date (manufacturers of industrial and medical gases and equipment); Director, Malayan Welding Products Sendirian Berhad, 13 Jalan 222, Petalin Jaya, PO Box 633, [illegible]la Lumpur, Malaysia, from July 1969 to date (manufacturers of and dealers in welding electrodes, machinery, tools, implements and appliances); Alternate director, New Zealand Industrial Gases Limited, Hutt Park Road, Lower Hutt, New Zealand, from May 1970 to date (manufacturers

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Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	Hutt, New Zealand (manufacturers of industrial and medical gases and equipment); Director, Pakistan Oxygen Limited, West Wharf, Karchi 2, Pakistan (manufacturers of industrial and medical gases and equipment); Director, Singapore Oxygen Pte Limited, Tan Chwee Boon Building, 10-1/2 Km Bukit Timah Road, PO Box 4001, Singapore 21 (manufacturers of industrial and medical gases and equipment); Director, Singapore Welding Pte Limited, Tan Chwee Boon Building, 10-1/2 Km Bukit Timah Road, PO Box 4001, Singapore 21 (manufacturers of and dealers in welding electrodes, machinery, tools, implements and appliances); Director, Tanzania Oxygen Limited, PO Box 911, No. 4 Pugu Road, Dar es Salaam, Tanzania (manufacturers of industrial and medical gases and equipment); Director, Uganda Oxygen Limited, PO Box 3002, 43-63 Seventh Street, Kampala, Uganda (manufacturers of industrial and medical gases and equipment); Director, International Co-ordination Welding Products Limited, Hammersmith House, London W6, England (the international co-ordination of the welding activities of the BOC Group).	of industrial and medical gases and equipment); Director, Pakistan Oxygen Limited, West Wharf, Karachi 2, Pakistan, from March 1970 to date (manufacturers of industrial and medical gases and equipment); Director, Singapore Oxygen Pte Limited, Tan Chwee Boon Building, 10-1/2 Km Bukit Timah Road, PO Box 4001, Singapore 21, from July 1969 to date (manufacturers of industrial and medical gases and equipment); Director Singapore Welding Pte Limited, Tan Chwee Boon Building, 4001, Singapore 21, from July 1969 to date (manufacturers of and dealers in welding electrodes, machinery, tools, implements and appliances); Director, Tanzania Oxygen Limited, PO Box 911, No. 4 Pugu Road, Dar es Salaam, Tanzania, from April 1971 to date (manufacturers of industrial and medical gases and equipment); Director, Uganda Oxygen Limited, PO Box 3002, 43-63 Seventh Street, Kampala, Uganda, from April 1971 to date (manufacturers of industrial and medical gases and equipment); Director, International Co-ordination Welding Products Limited, Hammersmith House, London W6, England, from June 1973 to date (the international co-ordination of the welding activities of the BOC Group); Chief Executive, Overseas Division, BOC, from March 1968 to February 1969; Chief Executive, Equipment Division, BOC, from January 1967 to March 1968; Chief Executive, Marketing Division, BOC, from August 1966 to January 1967; Chief Executive, Sales Division, BOC, from

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Name and Residence Address	Position With BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Peter Leister, The Thatches, 92 Seabeck Road, Wraysbury, Buckinghamshire, England	Managing Director, BOC; Director, Batchelors Limited, 72/73 Bannow Road, Cabra West, Dublin 7, Eire (processing, canning and bottling of food and beverages); Director, BOC-Linde Refrigeration Limited, Hammersmith House, London W6, England (manufacturers of commercial and industrial mechanical refrigeration and deep freeze equipment, including retail display cabinets); Director, BOC Pensions Limited, Hammersmith House, London W6, England (pension fund); Director, BOC Transhield Limited, Hammersmith House, London W6, England (food distribution service and general haulage and continental transport service); Director, Edwards High Vacuum (Canada) Limited, 430 South Service Road West, Oakville, Ontario, Canada (manufacturers of vacuum processing plant and instruments); Director, Edwards High Vacuum Inc., 256 Third Street, Niagara Falls, New York, U.S.A.	Managing Director, BOC, from February 1969 to date; Chief Executive, Gases Division, BOC, from November 1966 to February 1969; Chief Executive, Chemical Plant Division, BOC, from April 1966 to November 1966; Director, Batchelors Limited, 72/73 Bannow Road, Cabra West, Dublin 7, Eire, from April 1969 to date (processing, canning and bottling of food and beverages); Director, BOC-Linde Refrigeration Limited, Hammersmith House, London W6, England, from December 1968 to date (manufacturers of commercial and industrial mechanical refrigeration and deep freeze equipment including retail display cabinets); Director, BOC Pensions Limited, Hammersmith House, London W6, England, from June 1969 to date (pension fund); Director, BOC Transhield Limited, Hammersmith House, London W6, England, from June 1969 to date (food distribution service and general haulage and continental transport service); Director, Edwards High Vacuum (Canada) Limited, 430 South Service Road West, Oakville, Ontario, Canada, from February 1969 to date (manufacturers of vacuum processing

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me and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Business and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	(manufacturers of vacuum processing plant and instruments); Director, Euroshield Limited, Hammersmith House, London W6, England (international haulers and general carriers); Director, International Co-ordination, Welding Products Limited, Hammersmith House, London W6, England (the international co-ordination of the welding products activities of the BOC Group); Director, Mealstream (UK) Limited, Hammersmith House, London W6, England (manufacturers of Micro-Aire combined microwave and hot air electric ovens); Director, Finagaz SA, c/o Lenz, Schluep, Briner & de Coulon, 25 Grand rue 1211 Geneva 11, Switzerland (investment company); Director, AS Kulsyre & Tørisfabriken "Union", Vejle	plant and instruments); Director, Edwards High Vacuum Inc., 256 Third Street, Niagara Falls, New York, USA from July 1970 to date (manufacturers of vacuum processing plant and instruments); Director, Euroshield Limited, Hammersmith House, London W6, England, from March 1973 to date (international haulers and general carriers); Director, International Co-ordination, Welding Products Limited, Hammersmith House, London W6, England, from June 1973 to date (the international co-ordination of the welding products activities of the BOC Group); Director, Mealstream (UK) Limited, Hammersmith House, London W6, England, from August 1971 to date (manufacturers of Micro-Aire combined microwave and hot air electric ovens); Director, Finagaz SA, c/o Lenz, Schluep, Briner & de Coulon, 25 Grand rue 1211 Geneva 11, Switzerland, from May 1970 to date (investment company); Director, AS Kulsyre & Tørisfabriken "Union", Vejle Landevej 29, DK 7000, Fredericia, Denmark; from September 1972

Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Adress	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	Landevej 29, DK 7000, Fredericia, Denmark (manufacture and sale of carbon dioxide); Director, Smit Weld BV, Groenestraat 336, Nijmegen, Netherlands (manufacturers of electrodes for mild steel and special applications, submerged arc welding powders, special consumables for hardfacing); Member of the Board, The Maplin Development Authority, Victoria, London, England (United Kingdom government authority to plan, reclaim and develop new airport site)	to date (manufacture and sale of carbon dioxide); Director, Smit Weld BV, Groenestraat 336, Nijmegen, Netherlands, from February 1971 to date (manufacturers of electrodes for mild steel and special consumables for hardfacing); General Manager, Marketing Operations, Esso Petroleum Company Limited, Victoria Street, London SW1, England, from May 1962 to April 1966 (importers, refiners and distributors of petroleum products; ship owners); Member of the Board, The Maplin Development Authority, Victoria, London, England, from October 1973 to date (United Kingdom government authority to plan, reclaim and develop new airport site)

Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Colin Alan Bettridge Leslie, Kerves Brock, Kerves Lane, Horsham, Sussex, England	Company Secretary, BOC; Director, Investments; Director, Holdings; Holdings; Director British Oxygen (Far East) Limited, Hammersmith House, London W6, England (industrial and medical gases, chemical and metallurgical processes); Director, High Speed Steel Alloys Limited, Hammersmith House, London W6, England (manufacturers of inorganic chemicals); Director, Tonnox Construction Limited, Hammersmith House, London W6, England (development and supply of plant for manufacture of industrial gases); Director, British Oxygen Trustees Limited, Hammersmith House, London W6, England (BOC pension fund company); Director, Neon Properties Limited, 4 Carlton Gardens, Pall Mall, London SW1, England (property company); Director, Northern LP Gas Limited, Stephenson House, Northumbrian Way, Killingworth, Newcastle-upon-Tyne, Northumberland, England (transportation of liquid petroleum gas); Director, Xenon Properties Limited, 4 Carlton	Company Secretary, BOC, from January 1964 to date; Director, Holdings, from August 1961 to date; Director, British Oxygen (Far East) Limited, Hammersmith House, London W6, England from May 1973 to date (industrial and medical gases, chemical and metallurgical processes); Director, High Speed Steel Alloys Limited Hammersmith House, London W6, England, from May 1970 to date (manufacturers of inorganic chemicals); Director, Tonnox Construction Limited, Hammersmith House, London W6, England, from January 1964 to date (development and supply of plant for manufacture of industrial gases); Director, British Oxygen Trustees Limited, Hammersmith House, London W6, England, from April 1973 to date (BOC pension fund company); Director Neon Properties Limited, 4 Carlton Gardens, Pall Mall, London SW1, England, from June 1971 to date (property company); Director, Northern LP Gas Limited, Stephenson House, Northumbrian Way, Killingworth, Newcastle-upon-Tyne, Northumberland, England, from December 1963 to date (transportation of liquid petroleum gas); Director, Xenon Properties Limited, 4 Carlton Gardens, Pall Mall,

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me and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	Gardens, Pall Mall, London SW1, England (property company); Director, British Oxygen Finance BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands (finance company); Director, BOC Deutschland GmbH, 565 Solingen Grafrath, Schulstrasse 14, West Germany (holding company); Director, Norminoral Holding BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands (holding company); Director, Priestley Insurance Company Limited, PO Box 1255, Hamilton, Bermuda (insurance company).	London SW1, England, from March 1972 to date (property company); Director, British Oxygen Finance BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands from July 1973 to date (finance company); Director, BOC Deutschland GmbH, 565 Solingen Grafrath, Schulstrasse 14, West Germany, from August 1973 to date (holding company); Director, Norminoral Holding BV, c/o De Brauw en Helbach, Koninginnegracht 12B, The Hague, Netherlands, from July 1973 to date (holding company); Director, Priestley Insurance Company Limited, PO Box 1255, Hamilton, Bermuda, from September 1972 to date (insurance company)

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Home and Business Address	Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Leslie Edward Smith, St. Nicholas Farmhouse, Dunt Lane, Hurst, North Reading, Berkshire, England	Chairman, BOC; Director, Investments; Director, Holdings; Director, BOC Pensions Limited, Hammersmith House, London W6, England (pension fund); Director, Cryoplants Limited, Hammersmith House, London W6, England (cryogenic engineers); Director, Canadian Oxygen Limited, 355 Horner Avenue Toronto 14, Ontario, Canada (manufacturers of industrial and medical gases and equipment); Director, Indian Oxygen Limited, Oxygen House, P-34 Taratala Road, Calcutta 700053, India (manufacturers of industrial and medical gases and equipment); Director, New Zealand Industrial Gases Limited, Hutt Park Road, Lower Hutt, New Zealand (manufacturers of industrial and medical gases and equipment); Director, The Commonwealth Industrial Gases Limited, 46 Kippax Street, Surry Hills, New South Wales 2010, Australia (manufacturers of industrial and medical gases and equipment); Director, African Oxygen Limited, Afrox House, 23 Webber Street, Selby, PO Box 5404, Johannesburg, South Africa (manufacturer of industrial and medical gases and equipment)	Chairman, BOC from February 1972 to date; Director, Investments, from June 1973 to date; Director, Holdings from November 1963 to date; Director, BOC Pensions Limited, Hammersmith House London W6, England from January 1969 to date (pension fund); Director, Cryoplants Limited, Hammersmith House London W6, England, from November 1963 to date (cryogenic engineers); Director, Canadian Oxygen Limited, 355 Horner Avenue, Toronto 14, Ontario, Canada, from January 1970 to date (manufacturers of industrial and medical gases and equipment); Director, Indian Oxygen Limited, Oxygen House, P-34 Taratala Road, Calcutta 700053, India, from September 1969 to date (manufacturers of industrial and medical gases and equipment); Director, New Zealand Industrial Gases Limited, Hutt Park Road, Lower Hutt New Zealand from April 1970 to date (manufacturers of industrial and medical gases and equipment); Director, The Commonwealth Industrial Gases Limited, 46 Kippax Street, Surry Hills, New South Wales 2010, Australia, from December 1969 to date (manufacturers of industrial and medical gases and equipment); Director, African Oxygen Limited, Afrox House, 23 Webber Street, Selby, PO Box 5404, Johannesburg, South Africa, from August 1972 to date (manufacturer of industrial and medical gases and equipment

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ne and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
		Group Managing Director, BOC, from February 1969 to February 1972; Joint Managing Director, BOC, from January 1967 to February 1969; Commercial Director, BOC, from May 1965 to January 1967; Accountant, BOC, from October 1956 to May 1965.

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Residence	Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
Sir Owen Haddon Mansbrough-Jones, KBE, CB, Flat 6 7 King Street, St. James, London SW1, England	Director, BOC.	Director, BOC, from December 1959 to date; Director, Albright & Wilson Limited, PO Box 3, Warley, Oldbury, Worcs., England, from October 1959 to June 1969 (manufacturers of chemicals and allied products); Director, Albright & Wilson Pension Properties Limited, 1 Knightsbridge Green, London SW1, England, from April 1964 to July 1969 (pension fund); Director, Albright & Wilson Pension Trustees Limited, 1 Knightsbridge Green, London SW1, England, from March 1962 to June 1969 (pension fund); Chairman, Scottish Chemicals Limited, Empire House, 131 West Nile Street, Glasgow C2, Scotland, from October 1967 to July 1969 (chemical manufacturers).

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Name and Business Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
ohn Meredith Williams, The Glade, elwyn Garden City, ertfordshire, England	Managing Director, BOC. Director, Blackwell's Metallurgical Works Limited, Hammersmith House, London W6, England (metallurgists, refiners and transformers of ores); Director, BOC Pensions Limited, Hammersmith House, London W6, England (pension fund); Director, British Oxygen Chemicals Limited, Hammersmith House, London W6, England (manufacturers of chemicals and allied products); Director, British Oxygen Maydown Limited, Hammersmith House, London W6, England (manufacturers of acetylene for neoprene manufacture); Director, Cryoplants Limited, Hammersmith House, London W6, England (cryogenic engineers); Director, High Speed Steel Alloys Limited, Hammersmith House, London W6, England (manufacturers of inorganic chemicals); Director, Murex Limited, Hammersmith House, London W6, England (manufacturers of alloys and chemical derivatives); Director, North Sea Marine Rig Services Limited, 24 Virginia Street, Aberdeen Scotland AB1 2AU (services to the offshore oil industry);	Managing Director, BOC, from February 1969 to date; Director, Blackwell's Metallurgical Works Limited, Hammersmith House, London W6, England, from September 1971 to date (metallurgists, refiners and transformers of ores); Director, BOC Pensions Limited, Hammersmith House, London W6, England, from June 1969 to date (pension fund); Director, British Oxygen Chemicals Limited, Hammersmith House, London W6, England, from February 1972 to date (manufacturers of chemicals and allied products); Director, British Oxygen Maydown Limited, Hammersmith House, London W6, England, from February 1972 to date (manufacturers of acetylene for neoprene manufacture); Director, Cryoplants Limited, Hammersmith House, London W6, England, from April 1969 to date (cryogenic engineers); Director, High Speed Steel Alloys Limited, Hammersmith House, London W6, England, from September 1971 to date (manufacturers of inorganic chemicals); Director, Murex Limited, Hammersmith House, London W6, England, from September 1971 to date (manufacturers of alloys and chemical derivatives); Director, North Sea Marine Rig Services Limited, 24 Virginia Street, Aberdeen, Scotland AB1 2AU, from August 1973 to date (services to the offshore oil industry); Director, Production Tool Alloy Limited, Hammersmith House,

N-6 EXHIBIT

Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	Director, Production Tool Alloy Limited, Hammersmith House, London W6, England (manufacturers of hard metal products and sintered permanent magnets); Director, Prolite Limited, Hammersmith House, London W6, England (sales company); Director, SubOcean Services Limited, Hammersmith House, London W6, England (underwater welding specialists); Director, Tonnox Construction Limited, Hammersmith House, London W6, England (development and supply of plant for manufacture of industrial gases); Director, Triple-E (UK) Limited, Hammersmith House, London W6, England (manufacturers and merchants of chemicals and fuels); Director, Arunta (Scotland) Limited, Keith Inch, Peterhead, Aberdeenshire, Scotland (services to the offshore oil industry); Director, BOC-Nowsco Limited, Hammersmith House, London W6, England	London W6, England, from April 1972 to date (manufacturers of hard metal products and sintered permanent magnets); Director, Prolite Limited, Hammersmith House, London W6, England, from September 1971 to date (sales company); Director, SubOcean Services Limited, Hammersmith House, London W6, England, from September 1973 to date (underwater welding specialists); Director, Tonnox Construction Limited, Hammersmith House, London W6, England, from September 1969 to date (development and supply of plant for manufacture of industrial gases); Director, Triple-E (UK) Limited, Hammersmith House, London W6, England, from May 1973 to date (manufacturers and merchants of chemicals and fuels); Director, Arunta (Scotland) Limited, Keith Inch, Peterhead, Aberdeenshire, Scotland, from May 1973 to date (services to the offshore oil industry); Director, BOC-Nowsco Limited, Hammersmith House, London W6, England, from July 1973 to date (oil well services) Director, Neon Properties Limited, 4 Carlton Gardens, Pall Mall, London SW1, England, from June 1971 to date (property company); Director, Xenon Properties Limited, 4 Carlton

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Name and Residence Address	Position with BOC And Other Principal Occupation or Business; Principal Business of Any Such Company and Business Address	Material Occupations During the Last Ten Years or More Including the Name, Principal Business and Address of Each Such Occupation
	(oil well services); Director, Neon Properties Limited, 4 Carlton Gardens, Pall Mall, London SW1, England (property company); Director, Xenon Properties Limited, 4 Carlton Gardens, Pall Mall, London SW1, England (property company); Director, Odda Smeltevark A/S, Odda, Norway (manufacturers of calcium carbide and derivatives); Director, Irish Industrial Gases Limited, Bluebell, Dublin 12, Eire (manufacturer of industrial gases); Director, BOC Northern Ireland Limited, Prince Regent Road, Castlereagh, Belfast, Northern Ireland (manufacturer of industrial gases); Director, BOCNI Holdings Limited, Bluebell, Dublin 12, Eire (holding company)	Gardens, Pall Mall, London SW1, England, from March 1972 to date (property company); Director, Odda Smeltevark A/S, Odda, Norway, from March 1973 to date (manufacturers of calcium carbide and derivatives); Director, Irish Industrial Gases Limited, Bluebell, Dublin 12, Eire, from December 1969 to date (manufacturer of industrial gases); Director, BOC Northern Ireland Limited, Prince Regent Road, Castlereagh, Belfast, Northern Ireland, from December 1969 to date (manufacturer of industrial gases); Director, BOCNI Holdings Limited, Blue-Bell, Dublin 12, Eire, from March 1971 to date (holding company); Chief Executive Chemicals & Metallurgical Division, BOC, from March 1968 to February 1969; Chief Executive, Chemicals Division, BOC, from May 1965 to March 1968; General Sales Manager, Chemicals Division, BOC, October 1956 to May 1965

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EX-(2)-
2-9

AIRCO, Inc.

IMPORTANT

December 10, 1973

DEAR STOCKHOLDER:

Our letter of December 4, 1973 urged you to reject the Curtiss-Wright offer for up to 2,400,000 shares of Airco common stock at $18 per share and advised you that we would be writing to you regarding alternatives which you might consider.

There are enclosed materials relating to an offer by a subsidiary of The British Oxygen Company Limited ("BOC") to purchase 3,000,000 shares of Airco common stock at $20 per share.

Your Board of Directors believes that each stockholder should make his own decision concerning the BOC offer to purchase and, consequently, has cooperated by mailing such offer to you. The Airco Board has consented to BOC's offer and if it is successful, the Airco Board and management will continue discussions with BOC possibly leading to closer association of the two companies, and which they believe will be beneficial to both companies.

~~You should know that members of the Board of Directors and their families with their immediate families own or represent approximately ..... shares of Airco common stock and have indicated that they intend to tender ..... shares pursuant to the BOC offer.~~

On Behalf of the Board of Directors

Sincerely,

(Signature Cut—Offset)

RICHARD V. GIORDANO
President

(Signature Cut—Offset)

GEORGE S. DILLON
Chairman

A 4334

EXHIBIT 2

CHAS. P. YOUNG COMPANY / 75 VARICK STREET / NEW YORK / 212 431-5300

EX-12;
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(8349) Proof of December 9, 1973

BOC FINANCIAL CORPORATION

OFFER TO PURCHASE

3,000,000 COMMON SHARES

OF

AIRCO, INC.

FOR CASH

at

$20.00 Per Share Net

Offer Expires at 6:00 P.M., New York Time,
On December 21, 1973, Unless Extended

To the Holders of Common Shares of AIRCO, INC.:

BOC Financial Corporation, a Delaware corporation (the "Purchaser"), hereby offers to purchase 3,000,000 of the outstanding common shares, $1 par value (the "Shares"), of Airco, Inc., a New York corporation ("Airco"), at $20.00 per Share net to the seller, in cash, upon the terms and conditions set forth herein (the "Offer") and in the accompanying Letter of Transmittal (the "Letter of Transmittal"). Tendering shareholders will not be obligated to pay brokerage commissions, fees or transfer taxes on the purchase by the Purchaser.

THE OFFER WILL TERMINATE AT 6:00 P.M., NEW YORK TIME, ON DECEMBER 21, 1973, UNLESS EXTENDED BY THE PURCHASER. THE PURCHASER MAY EXTEND THE OFFER FROM TIME TO TIME.

1. *Number of Shares.* If not more than 3,000,000 Shares are duly tendered by 6:00 P.M., New York Time, on December 21, 1973 (such time and date being hereinafter referred to as the "Initial Expiration Date"), and not withdrawn as permitted by Section 2 hereof, the Purchaser will purchase all, but not less than all, Shares so tendered.

If more than 3,000,000 Shares are duly tendered by the Initial Expiration Date and not withdrawn as permitted by Section 2 hereof, the Purchaser will purchase 3,000,000 Shares, and may purchase any part or all of the excess over 3,000,000 Shares up to 4,000,000 Shares. If less than all Shares so tendered are purchased, the Shares will be purchased on a pro rata basis (adjusted to avoid the purchase of fractional Shares).

IMPORTANT

Any shareholder wishing to accept the Offer should (1) request his broker, dealer, bank, trust company or nominee to effect the transaction for him or (2) complete the Letter of Transmittal, sign it in the place required, have his signature guaranteed, and forward the Letter of Transmittal with his stock certificate(s) and any other required documents to the Depositary. Shareholders having Shares registered in the name of a broker, dealer, bank, trust company or nominee are urged to contact their broker, dealer, bank, trust company or nominee if they desire to tender their Shares.

(8349)

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If fewer than 3,000,000 Shares are duly tendered by the Initial Expiration Date but the number of Shares tendered increases to 3,000,000 or more during any extension or extensions of the Offer, the Purchaser (a) will purchase 3,000,000 Shares, and (b) may purchase any part or all of the excess over 3,000,000 Shares up to 4,000,000 Shares, on a first-come, first-served basis.

If the Purchaser decides to purchase more than 3,000,000 Shares, it may be necessary to borrow additional funds for that purpose; no commitments for any such borrowings have been obtained. (See Section 11 hereof for information with respect to borrowings being made in connection with the Offer.) In addition, the purchase of more than 3,000,000 Shares will require further approval of The Bank of England.

As set forth above, the Purchaser may extend the Offer from time to time. During any extension or extensions of the Offer, all Shares previously tendered and not yet purchased will remain subject to the Offer (subject to the withdrawal rights specified in Section 2 hereof) and may be purchased by the Purchaser. The later of the Initial Expiration Date and the latest time and date to which the Offer may be extended are hereinafter referred to as the "Expiration Date."

The obligation of the Purchaser to purchase any Shares is subject to the terms and conditions set forth in the Offer and the Letter of Transmittal, any of which may be waived by the Purchaser.

The 3,000,000 Shares that are the subject of the Offer constitute approximately 26% of the 11,324,731 Shares outstanding on December 4, 1973.

2. *Withdrawal Rights.* Shares tendered pursuant to the Offer may be withdrawn at any time prior to December 18, 1973. To be effective, notice of withdrawal must be received by the Depositary prior to such date. Any notice of withdrawal must specify the name of the person having deposited Shares to be withdrawn on particular Letters of Transmittal, the number of Shares to be withdrawn and the name of the shareholder and serial numbers shown on particular stock certificates evidencing Shares to be withdrawn. Shares may also be withdrawn, if not previously purchased by the Purchaser, at any time after February 8, 1974, in accordance with such procedure. Except as stated in this Section, tenders are irrevocable.

3. *Payment of Purchase Price.* Payment for all Shares duly tendered and purchased pursuant to the Offer for which certificates have been deposited with the Depositary will be made by the Depositary as soon as practicable following the purchase of such Shares pursuant to the Offer. If any tendered Shares are not purchased, certificates for such Shares will be returned without expense to the tendering shareholder as promptly as practicable after the Expiration Date. The Purchaser will pay all transfer taxes, if any, payable on the transfer to the Purchaser of duly tendered and purchased Shares and all charges and expenses of the Depositary.

Purchases from Airco shareholders pursuant to the Offer will be taxable transactions. Shareholders are urged to consult their tax advisers to determine the tax consequences to them in the event they tender.

4. *Acceptance of Offer for Shares.* To accept the Offer, certificates for Shares, together with a properly executed Letter of Transmittal and any other required documents, with signatures guaranteed, should be tendered by transmittal directly to the Depositary at the address indicated below.

Tenders may be made without concurrent deposit of certificates for Shares if such tenders are made by or through a member of any national securities exchange or by a United States commercial bank or trust company. In each such case the Letter of Transmittal must contain a guaranty by such member firm or such commercial bank or trust company that the tendered certificates and any other required documents will be deposited with the Depositary within four business days after the earlier of (a) the Expiration Date or (b) notification of the purchase of the Shares. No payment for Shares tendered in accordance with this paragraph and purchased pursuant to the Offer will be made until the Depositary has received delivery of the stock certificates for the Shares so tendered and any other required documents.

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If a shareholder desires to tender his Shares hereunder and time will not permit his Letter of Transmittal, Shares and any other required documents to reach the Depositary before the Expiration Date, his tender may be effected if the stock certificates and any other required documents, together with a properly executed Letter of Transmittal, with signatures guaranteed, have been deposited with a member of any national securities exchange or a United States commercial bank or trust company, and the Depositary has received, at or prior to the Expiration Date, a telegram or letter from such member firm or such commercial bank or trust company setting forth the name of the shareholder, the number of Shares tendered and, if available, the serial numbers of the certificates representing such Shares, and stating that the tender is being made thereby and that the stock certificates, together with the Letter of Transmittal and any other required documents, have been, or will be promptly, forwarded by such member firm or such commercial bank or trust company to the Depositary. Payment for Shares so tendered and purchased will be made only after receipt by the Depositary of such certificates, Letters of Transmittal and any other required documents, which must occur within four business days after the earlier of (a) the Expiration Date or (b) notification of the purchase of the Shares.

This Offer and the Letter of Transmittal will constitute an agreement between the tendering shareholder and the Purchaser, subject to the conditions of the Offer and the Letter of Transmittal, when the duly signed Letter of Transmittal, or a telegram or letter (as provided in the preceding paragraph) from a member of a national securities exchange or a United States commercial bank or trust company, is received by the Depositary.

By executing the Letter of Transmittal as set forth above, the shareholder irrevocably appoints designees of the Purchaser as proxies, to the extent of said shareholder's rights, effective when, and only to the extent that, the Purchaser purchases the Shares tendered by such shareholder. To such extent, all prior proxies appointed by such shareholder will be revoked. Such designees will vote any Shares as they in their discretion may deem proper at any annual, special or adjourned meeting of Airco's shareholders.

5. *Dividends and Distributions.* If Airco should declare any dividend or distribution (including, without limitation, additional Shares issuable pursuant to a stock dividend or stock split or rights with respect to any securities) with respect to the Shares which is payable to shareholders of record on a date occurring prior to the transfer to the name of the Purchaser or its nominee on Airco's stock transfer records of the Shares purchased pursuant to the Offer, then (a) the purchase price per Share payable by the Purchaser pursuant to the Offer will be reduced by the amount of any such cash dividend or dividends; and (b) the gross amount of any other such dividend or distribution (including, without limitation, additional Shares or rights as aforesaid) will be required to be remitted by each tendering shareholder to the Depositary for the account of the Purchaser, and pending such remittance or appropriate assurance thereof, the Purchaser may withhold the purchase price or deduct from the purchase price the amount or value of such other dividend or distribution as to any Shares purchased by the Purchaser but not transferred to the name of the Purchaser or its nominee prior to the record date therefor. The Purchaser anticipates that the record date for Airco's next dividend will not be until February 1974.

6. *Certain Conditions of the Offer.* The Purchaser shall not be required to purchase or pay for any Shares tendered if, before the time of payment therefor:

(a) there shall have been instituted or threatened any action or proceedings before any court or governmental or other regulatory or advisory agency or commission, by any governmental agency or other regulatory or advisory agency or commission or by any other person, affecting, directly or indirectly, the Purchaser, The British Oxygen Company Limited, a United Kingdom company ("BOC"), or Airco, that is, in the judgment of the management of BOC or Purchaser, materially adverse, or challenging the acquisition by the Purchaser of the Shares; or

(b) Airco shall have (i) issued or authorized or proposed the issuance of additional shares of capital stock of any class or securities convertible into any such shares, other than Shares issued

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upon the exercise of outstanding stock options or upon the conversion of outstanding convertible debentures, or (ii) issued or authorized or proposed the issuance of any other securities in respect of, in lieu of, or in substitution for, its now outstanding Shares, or (iii) authorized or proposed any merger, consolidation, acquisition of assets, disposition of assets, or material change in its capitalization, or other comparable event not in the ordinary course of business; or

(c) any change shall have occurred or be threatened in the business or operations of Airco and its subsidiaries, taken as a whole, which is, in the judgment of the Purchaser's management, materially adverse, or any dividend or distribution shall have been declared or made by Airco, other than a regular quarterly dividend not exceeding $.20 per share; or

(d) the Bank of England shall have withdrawn or materially altered the terms of its approval of the transactions contemplated by the Offer or related thereto; or

(e) there shall have been (i) any suspension of trading in, or limitation on prices for, the Shares, BOC's ordinary shares or securities generally, on the New York Stock Exchange, the American Stock Exchange, or The Stock Exchange in London; (ii) the declaration of a banking moratorium by federal or New York State or United Kingdom authorities; (iii) the commencement of a war, armed hostilities or other international or national calamity directly or indirectly involving the United States or the United Kingdom, or, in the case of any of the foregoing existing at the time of the commencement of the Offer, a material acceleration or worsening thereof; or (iv) a material change in United States, United Kingdom or any other material currency exchange rates or a suspension of, or limitation on, the markets therefor,

as a result of which, in the opinion of the management of BOC or Purchaser, it is inadvisable to proceed with the purchase or payment.

7. *Solicitation and Other Fees.* The Purchaser will pay to any broker or dealer (including the Dealer Manager) that is a member of a national securities exchange or of the National Association of Securities Dealers, Inc., or to any foreign broker or dealer that agrees to conform to the Rules of Fair Practice of such Association in soliciting acceptances in the United States, or to any commercial bank or trust company the name of which appears in the appropriate space in the Letter of Transmittal ("Soliciting Dealers"), a solicitation fee of $.50 for each Share purchased hereunder. No Soliciting Dealer shall be the agent of the Purchaser, the Dealer Manager, or the Depositary for purposes of the Offer. Lazard Frères & Co., One Rockefeller Plaza, New York, New York 10020, will act as Dealer Manager for the Purchaser in connection with the Offer. The Dealer Manager will receive a fee of $.15 (in addition to any fees received by it as a Soliciting Dealer) for each Share so purchased, with a minimum fee of $100,000 whether or not any Shares are purchased; will be reimbursed by the Purchaser for its reasonable out-of-pocket expenses; and will be indemnified by the Purchaser against certain civil liabilities in connection with the Offer. First National City Bank, as Depositary, will receive reasonable and customary compensation for its services hereunder and reimbursement for its reasonable out-of-pocket expenses. The Kissel-Blake Organization, Inc. (the "Soliciting Agent") has been retained by the Purchaser to aid in soliciting acceptances of the Offer and will receive reasonable and customary compensation, with minimum compensation of $7,500, for such services and reimbursement for its reasonable out-of-pocket expenses.

8. *Extension of Tender Period.* The Purchaser expressly reserves the right, at any time or from time to time, whether before or after the Initial Expiration Date, to extend the period of time for which the Offer is open, by written notice of such extension to the Depositary.

9. *Certain Information Concerning Airco.* The Shares are listed on the New York Stock Exchange and certain regional exchanges and are traded on certain additional stock exchanges. The high and low

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sales prices of the Shares reported on the New York Stock Exchange for the periods indicated are as follows:

	High	Low
1971	$26½	$16¼
1972	23¾	16½
1973		
First Quarter	18¼	13⅜
Second Quarter	14⅜	11⅛
Third Quarter	12⅝	10¾
Fourth Quarter (through December 7, 1973)	15⅜	11⅞

The closing sales price of the Shares on the New York Stock Exchange on November 30, 1973, the last day of trading prior to the announcement by Curtiss-Wright Corporation of an offer to purchase 2,400,000 Shares at $18.00 per Share, net was $12¾. On December 5, 1973, Airco commenced an action in the United States District Court for the District of New Jersey to enjoin any purchases of Shares pursuant to the Curtiss-Wright tender offer. The closing sales price of the Shares on the New York Stock Exchange on December 7, 1973, the last full day of trading prior to the announcement of the Offer, was $15⅞ per Share.

On November 28, 1973, Airco reported that as of that date it had purchased, either in the open market or in third-market transactions, an aggregate of 621,900 Shares (out of a total of 707,000 Shares the purchase of which had previously been authorized by Airco's Board of Directors) over an unspecified period of time. Airco further stated that its Board of Directors had authorized the purchase of an additional 300,000 Shares for acquisitions and other general corporate purposes. In a Schedule 14D filed by Airco with the Securities and Exchange Commission (the "Commission") on December 4, 1973, Airco stated that 211,400 of the above-mentioned 621,900 Shares had been purchased between September 11 and November 28, 1973, and that an additional 900 Shares were purchased on November 29, 1973.

Airco is subject to the informational requirements of the Securities Exchange Act of 1934 and in accordance therewith files reports and other information with the Commission relating to its business, financial statements and other matters. Information, as of particular dates, concerning Airco's directors and officers, their remuneration, options granted to them, the principal holders of Airco's securities and any material interest of such persons in transactions with Airco is disclosed in proxy statements distributed to Airco's shareholders and filed with the Commission. Such reports and proxy statements, filings in connection with the Curtiss-Wright tender offer and other information may be inspected at the Commission's office in Room 6101, 1100 L Street, N. W., Washington, D. C., and copies may be obtained upon payment of the Commission's customary charges by writing to the Commission's principal office, 500 North Capitol Street, N. W., Washington, D. C. 20549. Such material may also be inspected at the library of the New York Stock Exchange, Inc., 20 Broad Street, New York, New York.

The Purchaser does not think that the purchase of the 3,000,000 Shares that are the subject of the Offer will give rise to a question as to whether the Shares will continue to meet the listing requirements of the New York Stock Exchange, Inc. If, however, additional Shares are tendered and purchased by the Purchaser, or if a substantial number of Shares is purchased by Curtiss-Wright, questions as to the continued listing of the Shares on such Exchange could be presented. Furthermore, if the Purchaser purchases more than 3,397,419 Shares, such Exchange may not be willing to list any additional Shares.

Airco's Annual Report on Form 10-K for its fiscal year ended December 31, 1972, filed with the Commission, indicates that for such fiscal year Airco's income from continuing operations was $17,944,000 ($1.53 per Share) and net income was $2,021,000 ($.17 per Share). In a letter to stockholders contained in a Schedule 14D filed by Airco with the Commission on December 5, 1973, Airco furnished its stockholders information as to its current book value, third-quarter earnings, business prospects and other information.

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10. *Certain Information Concerning the Purchaser.* The Purchaser, a Delaware corporation the address of which is [redacted] State Street, Dover, Delaware 19901, was organized solely for the purpose of the Offer, and has engaged in no business prior to the date hereof except in connection with the Offer. The names, adresses and principal occupations of the officers and directors of the Purchaser are set forth in Exhibit A.

The Purchaser's common stock is wholly owned by BOC Holdings Limited, a United Kingdom company ("Holdings"); Holdings is wholly-owned by British Oxygen Investments Limited, a United Kingdom company ("Investments"), which is wholly owned by BOC. The address of Holdings, Investments and BOC is Hammersmith House, London W6, England. Holdings and Investments are engaged in holding various securities of subsidiaries (direct and indirect) of BOC; the names, addresses and principal occupations of the officers and directors of Holdings and Investments are set forth in Exhibits B and C, respectively.

BOC, the ordinary shares of which are traded on The Stock Exchange in London, is engaged in the manufacture of industrial, medical and rare gases, welding equipment, chemicals, special metals, air separation equipment, medical equipment, aircraft breathing systems, cryogenic systems and equipment, vacuum equipment and instrumentation, and food products. BOC's Annual Report for its fiscal year ended September 30, 1972, has been filed with the Commission as an Exhibit to the statement on Schedule 13D filed by the Purchaser with the Commission in connection with the Offer. Such report may be inspected during ordinary business hours at the Commission's office in Room 6101, 1110 L Street, N.W., Washington, D. C., and copies may be obtained, upon payment of the Commission's customary fees, at the Commission's principal office, 500 North Capitol Street, N.W., Washington, D.C. 20549. The names, addresses and principal occupations of the officers and directors of BOC are set forth in Exhibit D.

11. *Source and Amount of Funds.* To pay for its purchase of Shares and related expenses, Purchaser intends to obtain an aggregate sum of up to $72,000,000, as follows:

Investments has obtained commitments for a commitment fee of ¼ of 1% pursuant to which it may borrow an aggregate of up to $72,000,000 from two United Kingdom banks and four United Kingdom branches of United States banks under 7-year loans bearing interest at a rate of ¾ of 1% above the London inter-bank rate for Euro-dollars in effect from time to time. Principal of such loans will be repayable during the sixth and seventh years in five equal semi-annual installments. Such loans may be prepaid at any time and will be guaranteed by BOC; the loans and guaranties will be unsecured. Investments will lend the proceeds of such loans to Holdings, which will use them to acquire all of Purchaser's common stock.

12. *Purpose of the Offer.* The purpose of the Offer is to allow the Purchaser to acquire a significant holding in Airco such that BOC will be able to influence and participate in the development of Airco policy and business strategy. Thus, if the Purchaser obtains a significant shareholding, BOC intends to exercise this influence and participation through representation on Airco's Board of Directors. Airco has agreed that if BOC holds or owns, directly or indirectly, 1,000,000 or more Shares, it will elect to the Airco Board of Directors, and at future meetings of Airco shareholders it will nominate for election to Airco's Board of Directors, such number of representatives of BOC as will represent approximately the same percentage of the Airco directors as the Purchaser's holdings represent of the Shares. If BOC directly or indirectly acquires more than 2,400,000 Shares, the BOC Board of Directors has the intention of inviting George S. Dillon and Richard V. Giordano to become members of the BOC Board of Directors.

Neither the Purchaser, Holdings, Investments nor BOC (Holdings, Investments and BOC being hereinafter referred to collectively as the "Purchaser's Parents") has any plans or proposals to liquidate Airco, to sell Airco's assets or to merge it with any other persons, or to make any other major change in [redacted] (BOC wants)

effect to work with Airco in considering the businesses in which Airco is engaged. No plans, proposals or changes would be undertaken without the mutual consent of the Airco Board of Directors and the BOC Board of Directors

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Such actions might be the result of events require the approval of more Shares than would be owned by the Purchaser.

It is possible that at a future date not yet determinable the Purchaser will formulate and make proposals to the Airco Board of Directors to acquire additional interests in Airco.

13. *Interest in Securities of the Issuer; Agreements.* Neither the Purchaser nor any of Purchaser's Parents, and to the best of the Purchaser's knowledge, no officer or director of the Purchaser or of any of Purchaser's Parents and no associate of the Purchaser or of any of Purchaser's Parents or of any such officer or director, owns, or has a right to acquire, directly or indirectly, any Shares. No transactions in Shares were effected during the past 60 days by the Purchaser or any of Purchaser's Parents or, to the best of the Purchaser's knowledge, by any officer, director or affiliated person of the Purchaser or any of Purchaser's Parents, by any subsidiary of the Purchaser or any of Purchaser's Parents, or by any officer, director or affiliated person of any such subsidiary.

In connection with the decision by BOC and Airco to study the feasibility of establishing closer relationships they

[redacted] entered into an agreement dated July 25, 1973, pursuant to which they have agreed to exchange confidential data [redacted] their respective businesses. Each party agreed not to use any of such information for commercial purposes without the written consent of the other party and that without such consent neither party would make, or authorize or permit any of its affiliates to make, a tender, exchange or other offer for any securities of the other until July 25, 1978. The Board of Directors of Airco has approved the Offer as required by such agreement. BOC and Airco have modified the agreement so that, if any person, without BOC's prior acquiescence, acquires 20% of the Shares, or hereafter files with the Commission materials required in order to acquire or to make an offer with respect to which there has been no filing on the date hereof to acquire Shares which would bring the aggregate of such person's holding of Shares to 15% or more of the Shares, then the agreement between BOC and Airco of July 25, 1973, shall, to the extent it would limit BOC's right to make a tender, exchange or other offer, cease to be applicable. Such modification also provides that if Purchaser should in the future decide to dispose of its Shares, which it does not now contemplate, it will first offer them to Airco.

BOC has agreed to an arrangement

Except as set forth in Section 7 hereof and in the preceding paragraph, neither the Purchaser nor any of the Purchaser's Parents, and no director or officer of the Purchaser or any of Purchaser's Parents, has any contracts, arrangements or understandings with any person with respect to any securities of Airco, including but not limited to transfer of any of the securities, joint ventures, loan or option agreements, puts or calls, guaranties of loans, guaranties against loss or guaranties of profits, division of losses or profits, or the giving or withholding of proxies.

14. *United Kingdom Exchange and Taxation Controls; Foreign Control.* Because the Purchaser is controlled by a United Kingdom company, it is subject to certain controls by United Kingdom governmental authorities under the Exchange Control Act, 1947, of the United Kingdom. The acquisition by the Purchaser of the 3,000,000 Shares that are the subject of the Offer requires approval of the Bank of England, which approval has been obtained and remains in effect. Under the same Act, the United Kingdom Treasury (the "Treasury"), either itself or through the Bank of England, would, if the Purchaser obtained control of Airco, have authority to direct the Purchaser's Parents as to the exercise of their rights as parent companies of, or otherwise in relation to, Airco. It could, among other things, cause Airco or any company controlled by it (a) to provide the Treasury with such particulars as to its assets or business as the Treasury may determine, (b) to sell or procure the sale of specified gold or currency as directed by the Treasury, (c) to declare and pay such dividends as may be specified by the Treasury, (d) to realize any of its assets in a manner directed by the Treasury, and (e) to refrain from disposing of such securities as may be directed by the Treasury.

If the Purchaser obtained control of Airco, under the provisions of Section 482 of the Income and Corporation Taxes Act, 1970, of the United Kingdom (but subject to certain general consents currently in force), the specific consent of the Treasury would also be required before the Purchaser's Parents could lawfully: (a) permit Airco or any company controlled by it to create or issue any shares or debentures, or (b) transfer (or permit the Purchaser to transfer) any shares or debentures of Airco or permit Airco or any company controlled by it to transfer any shares or debentures of any body corporate

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which is controlled by any of the Purchaser's Parents. For purposes of such Section 482, the terms "shares" and "debentures" have the meanings ascribed thereto by Section 455 of the Companies Act, 1948, of the United Kingdom and the word "control" has the meaning ascribed thereto by Section 534 of the Income and Corporation Taxes Act, 1970, of the United Kingdom.

The Purchaser has not made an investigation to determine in what other respects (if any) Airco may be prejudiced if it should come under foreign control as a result of the Offer. Although the Purchaser does not expect Airco to be materially prejudiced under existing state and federal laws in the United States from carrying on its operations as now conducted if Airco comes under the control of the Purchaser, there is no assurance that Airco may not incur some material adverse effects.

15. *Miscellaneous.* The Offer is not being made to, nor will the Purchaser accept tenders from, holders of Shares in any jurisdiction in which the Offer or the acceptance thereof would not be in compliance with the securities laws of such jurisdiction. In any jurisdiction the securities laws of which require the Offer to be made by a licensed dealer, the Offer is made on behalf of the Purchaser by Lazard Frères & Co., in jurisdictions in which it is so licensed, or by other brokers or dealers who may be authorized to make the Offer on behalf of the Purchaser in jurisdictions in which such brokers or dealers are so licensed. No person has been authorized to give any information or make any representation on behalf of the Purchaser not contained herein, and if given or made such information or representation must not be relied upon as having been authorized.

Pursuant to Rule 14d-1 of the General Rules and Regulations under the Securities Exchange Act of 1934, as amended, the Purchaser filed with the Commission a statement on Schedule 13D furnishing certain additional information with respect to the Offer.

The Purchaser reserves the absolute right to reject any and all tenders not in proper form or to waive any irregularities or conditions of tender, and its interpretation of the terms and conditions of the Offer (including the instructions to the Letter of Transmittal) will be final.

Requests for additional copies of the Offer and of the Letter of Transmittal may be directed to the Dealer Manager, the Depositary, the Soliciting Agent or the shareholder's broker, dealer, bank, trust company or nominee. Telephone inquiries to the Dealer Manager or the Soliciting Agent may be made by collect telephone call.

December 10, 1973

BOC FINANCIAL CORPORATION

Dealer Manager:
LAZARD FRÈRES & Co.
Attention: Syndicate Department
One Rockefeller Plaza, 31st Floor
New York, New York 10020
(212) 489-6600, Ext. 325
(Call Collect)

Depositary:
FIRST NATIONAL CITY BANK

By mail:
FIRST NATIONAL CITY BANK
Special Corporate Services Department
P. O. Box 447
Church Street Station
New York, New York 10008

By hand:
FIRST NATIONAL CITY BANK
Special Corporate Services Department
111 Wall Street
3rd Floor
New York, New York

Soliciting Agent:
THE KISSEL-BLAKE ORGANIZATION, INC.
50 Broadway
New York, New York 10004
(212) 344-0733
(Call Collect)

EXHIBIT A

Name	Business Address	Position with Purchaser and Other Principal Occupation or Business
Paul Graham Bosonnet	See Exhibit C	See Exhibit C
Adrian W. DeWind	345 Park Avenue, New York, New York 10022	President and Director, Purchaser; Partner, Paul, Weiss, Rifkind, Wharton & Garrison (law firm)
Steven P. Dolberg	345 Park Avenue, New York, New York 10022	Secretary, Purchaser; Attorney, Paul, Weiss, Rifkind, Wharton & Garrison (law firm)
John E. Massengale	345 Park Avenue, New York, New York 10022	Director, Purchaser; Partner, Paul, Weiss, Rifkind, Wharton & Garrison (law firm)

EXHIBIT B

Name	Business Address	Position With Holdings and Other Principal Occupation or Business
Paul Graham Bosonnet	See Exhibit C	See Exhibit C
Robert Christopher Hesketh-Jones	See Exhibit D	See Exhibit D
Ronald Charles Hill	See Exhibit C	See Exhibit C
Colin Alan Bettridge Leslie ..	See Exhibit D	See Exhibit D
Leslie Edward Smith	See Exhibit D	See Exhibit D

EXHIBIT C

Name	Business Address	Position With Investments and Other Principal Occupation or Business
Paul Graham Bosonnet	Hammersmith House London W6, England	Director, Investments; Director of Group Strategy, BOC; Director, Holdings; Vice President and Director, Purchaser; Director, Tonnox Construction Limited (development and supply of industrial gases); Director, BOC Deutschland GmbH (holding company); Director, British Oxygen Finance BV (finance company); Director, Normineral Holding BV (holding company)
Robert Christopher Hesketh-Jones	See Exhibit D	See Exhibit D
Ronald Charles Hill	Hammersmith House London W6, England	Company Secretary, Investments; Internal Registrar, BOC; Company Secretary, Holdings
Colin Alan Bettridge Leslie ..	See Exhibit D	See Exhibit D
Leslie Edward Smith	See Exhibit D	See Exhibit D

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EXHIBIT D

Name	Business Address	Position With BOC and Other Principal Occupation or Business
Sir John Guise Cowley, GC, KBE, CB	Hammersmith House London W6, England	Director, BOC; Director, Keith & Henderson Limited (property company)
Sir Geoffrey Cecil Ryves Eley, CBE	Crewe House, Curzon Street London W1Y 8AZ, England	Vice Chairman, BOC; Chairman, Thomas Tilling Limited (industrial holding company); Chairman, Heinemann Group of Publishers (publishers); Deputy Chairman, British Bank of the Middle East (bank); Director, Equity & Law Life Assurance Society Limited (life assurance company); Director, East Bergholt Estate Company (estate holding company); Director, BOC Pensions Limited (pension fund); Director, The Law Reversionary Interest Society Limited (life assurance company)
Samuel Charles, Lord Elworthy, GCB, CBE, DSO, MVO, DFC, AFC ..	Hammersmith House London W6, England	Director, BOC; Governor of Windsor Castle; Lord Lieutenant of Greater London; Director, British Petroleum Company Limited (holding company); Director, The Plessey Company Limited (manufacturers of electronic equipment); Director, The National Bank of New Zealand (bank); Director, Rolls Royce (1971) Limited (manufacturers of aero engines); Director, Scientific Control Systems Holding Limited (holding company); Regional Director, Central London Regional Board of Lloyds Bank Limited (bankers); Director, British Petroleum Tanker Company Limited (shipping company); Director, British Petroleum Clyde Tanker Company Limited (shipping company); Director, The Tanker Insurance Company Limited (insurance company); Director, United Kingdom Board of Australian Mutual Provident Society (mutual society undertaking life and annuity business)
Ian James Fraser, CBE, MC	11 Old Broad Street London EC2P 2HT, England	Director, BOC; Deputy Chairman, Lazard Brothers & Co., Limited (merchant bankers); Director, The Whitehall Trust Limited (investment trust); Director, Davy International Limited (engineering company); Part time member, Civil Aviation Authority (British Gov-

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Name	Business Address	Position With BOC and Other Principal Occupation or Business
		ernment regulatory body); Chairman, Rolls-Royce Motors Limited (manufacturers of motor cars)
Robert Christopher Hesketh-Jones	Hammersmith House London W6, England	Managing Director, BOC; Director, Investments; Director, Holdings; Director, British Oxygen (Far East) Limited (manufacturers of electric arc welding equipment); Director, Indian Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, Malayan Oxygen Sendirian Berhad (manufacturers of industrial and medical gases and equipment); Director, Malavan Welding Products Sendirian Berhad (manufacturers of and dealers in welding electrodes, machinery, tools, implements and appliances); Alternate director, New Zealand Industrial Gases Limited (manufacturers of industrial and medical gases and equipment); Director, Pakistan Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, Singapore Oxygen Pte Limited (manufacturers of industrial and medical gases and equipment); Director, Singapore Welding Pte Limited (manufacturers of and dealers in welding electrodes, machinery, tools, implements and appliances); Director, Tanzania Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, Uganda Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, International Co-ordination Welding Products Limited (the international co-ordination of the welding activities of the BOC Group); Canadian Oxygen Limited (manufacturers of industrial and medical gases); Director, Ceylon Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, BOC Pensions Limited (pension fund); Director, British Oxygen (Hong Kong) Limited (holding company); Alternate director, The Commonwealth Industrial Gases Limited (manufacturers of industrial and medical gases and equipment); Director, East African Oxygen Limited

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Ex-125-2-21

Name	Business Address	Position With BOC and Other Principal Occupation or Business
		(manufacturers of industrial and medical gases and equipment); Director, Electric Arc (Jamaica) Limited (manufacturers of electric arc welding equipment)
Peter Laister	Hammersmith House London W6, England	Managing Director, BOC; Director, Batchelors Limited (processing, canning and bottling of food and beverages); Director, BOC-Linde Refrigeration Limited (manufacturers of commercial and industrial mechanical refrigeration and deep freeze equipment, including retail display cabinets); Director, BOC Pensions Limited (pension fund); Director, BOC Transhield Limited (food distribution service and general haulage and continental transport service); Director, Edwards High Vacuum (Canada) Limited (manufacturers of vacuum processing plant and instruments); Director, Edwards High Vacuum Inc., (manufacturers of vacuum processing plant and instruments); Director, Euroshield Limited (international haulers and general carriers); Director, International Co-ordination Welding Products Limited (the international co-ordination of the welding products activities of the BOC Group); Director, Mealstream (UK) Limited (manufacturers of Micro-Aire combined microwave and hot air electric ovens); Director, Finagaz SA (investment company); Director, AS Kulsyre & Torisfabriken "Union" (manufacture and sale of carbon dioxide); Director, Smit Weld BV (manufacturers of electrodes for mild steel, submerged arc welding powders, and special consumables for hardfacing); Member of the Board, The Maplin Development Authority (United Kingdom government authority to plan, reclaim and develop new airport site)
Colin Alan Bettridge Leslie ..	Hammersmith House London W6, England	Company Secretary, BOC; Director, Investments; Director, Holdings; Director, British Oxygen (Far East) Limited (industrial and medical gases, chemical and metallurgical processes); Director, High Speed Steel Alloys Limited (manufacturers of inorganic chemicals);

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Name	Business Address	Position With BOC or Other Principal Occupation or Business
		Director, Tonnox Construction Limited (development and supply of plant for manufacture of industrial gases); Director, British Oxygen Trustees Limited (BOC pension fund company); Director, Neon Properties Limited (property company); Director, Northern LP Gas Limited (transportation of liquid petroleum gas); Director, Xenon Properties Limited (property company); Director, British Oxygen Finance BV (finance company); Director, BOC Deutschland GmbH (holding company); Director, Nominaral Holding BV (holding company); Director, Priestley Insurance (insurance company)
Leslie Edward Smith	Hammersmith House London W6, England	Chairman, BOC; Director, Investments; Director, Holdings; Director, BOC Pensions Limited (pension fund); Director, Cryoplants Limited (cryogenic engineers); Director, Canadian Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, Indian Oxygen Limited (manufacturers of industrial and medical gases and equipment); Director, New Zealand Industrial Gases Limited (manufacturers of industrial and medical gases and equipment); Director, The Commonwealth Industrial Gases Limited (manufacturers of industrial and medical gases and equipment); Director, African Oxygen Limited (manufacturer of industrial and medical gases and equipment)
Sir Owen Haddon Wansbrough-Jones, KBE, CB ..	Hammersmith House London W6, England	Director, BOC
John Meredith Williams	Hammersmith House London W6, England	Managing Director, BOC; Director, Blackwell's Metallurgical Works Limited (metallurgists, refiners and transformers of ores); Director, BOC Pensions Limited (pension fund); Director, British Oxygen Chemicals Limited (manufacturers of chemicals and allied products); Director, British Oxygen Maydown Limited (manufacturers of acetylene for neoprene manufacture); Director, Cryoplants Limited (cryogenic engineers); Director, High Speed Steel Alloys Limited

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EX-125-2-23

Name	Business Address	Position With BOC and Other Principal Occupation or Business
		(manufacturers of inorganic chemicals); Director, Murex Limited (manufacturers of alloys and chemical derivatives); Director, North Sea Marine Rig Services Limited (services to the offshore oil industry); Director, Production Tool Alloy Limited (manufacturers of hard metal products and sintered permanent magnets); Director, Prolite Limited (sales company); Director, SubOcean Services Limited (underwater welding specialists); Director, Tonnox Construction Limited (development and supply of plant for manufacture of industrial gases); Director, Triple-E (UK) Limited (manufacturers and merchants of chemicals and fuels); Director, Aruma (Scotland) Limited (services to the offshore oil industry); Director, BOC-Nowsco Limited (oil well servicing); Director, Neon Properties Limited (property company); Director, Xenon Properties Limited (property company); Director, Irish Industrial Gases Limited (manufacturer of industrial gases); Director, BOC Northern Ireland Limited (manufacturer of industrial gases); Director, BOCNI Holdings Limited (holding company)

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EXHIBIT 3

Ex-126-
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LETTER OF TRANSMITTAL

for Common Shares of

AIRCO, INC.

tendered pursuant to the Offer to Purchase
dated December 10, 1973, of BOC Financial Corporation

Name and Address of Registered Holder	Certificates Enclosed (Attach list if necessary)		
	Certificate No. (If available)	No. of Shares	No. of Shares Tendered
	Total Shares		

By mail:
FIRST NATIONAL CITY BANK
Special Corporate Services Department
P. O. Box 447
Church Street Station
New York, New York 10008

By hand:
FIRST NATIONAL CITY BANK
Special Corporate Services Department
111 Wall Street
3rd Floor
New York, New York

PLEASE READ CAREFULLY THE INSTRUCTIONS ON THE REVERSE SIDE

Gentlemen:

The undersigned registered holder of the certificate(s) referred to above hereby accepts the offer of BOC Financial Corporation, a Delaware corporation (the "Purchaser"), contained in the Offer to Purchase dated December 10, 1973, receipt of which is hereby acknowledged, to purchase common shares (the "Shares") of Airco, Inc., a New York corporation ("Airco"), at a price of $20.00 per Share net to the seller, in cash, upon the terms and conditions set forth therein and herein.

Accordingly, the undersigned hereby deposits or agrees to deposit with you the above certificates representing Shares. You are hereby authorized and instructed (a) to sell, assign and transfer all of the Shares represented by the above-described certificates that are being tendered pursuant to the Offer to Purchase and this Letter of Transmittal and that are purchased by the Purchaser, and to deliver said certificates, together with all accompanying evidence of transfer and authenticity, to or upon the order of the Purchaser upon receipt by you, as the undersigned's agent, of the purchase price, (b) to cause such Shares to be transferred on the books of Airco, (c) to exercise all rights of beneficial ownership of such Shares, and (d) to receive all dividends and shares resulting from any stock dividend, split, combination or exchange of Shares to which the undersigned would be entitled by virtue of the ownership of such Shares—all in accordance with the terms of the Offer to Purchase. The undersigned understands and agrees that the Shares that are purchased by the Purchaser will be delivered by you to the Purchaser upon the delivery to you of funds in payment for such Shares. The undersigned further understands that appropriate adjustment of the purchase price and number of Shares to be purchased and delivered will be made to account for any alteration in the rights of the undersigned, all as provided in Section 5 of the Offer to Purchase.

The check for the purchase price of such of the above Shares as are purchased should be issued to the order of the undersigned and mailed to the address shown above (unless otherwise indicated below under the Special Payment Instructions or the Special Delivery Instructions). If duly tendered Shares are not purchased, certificates for such Shares will be delivered by registered mail to the undersigned at the address shown above (unless otherwise indicated below under the Special Payment Instructions or the Special Delivery Instructions), without expense to the undersigned.

The undersigned hereby irrevocably appoints C.A.B. Leslie and A. W. DeWind, or either of them, the attorneys and proxies of the undersigned, with full power of substitution, to vote in such manner as either such attorney and proxy or substitute shall in his sole discretion deem proper, all of the Shares which the undersigned is entitled to vote at any meeting (whether annual or special, and whether or not an adjourned meeting) of Airco and which have been purchased by the Purchaser prior to the date of such meeting. This proxy is irrevocable and is granted in consideration of the purchase by the Purchaser of such Shares and upon such purchase shall revoke any other proxy granted by the undersigned to vote, at any time after such purchase, such Shares.

The undersigned hereby represents and warrants that the undersigned has full power and authority to tender and sell the Shares without restriction to the Purchaser, and that the Purchaser will acquire good and marketable title thereto, free and clear of all liens, restrictions, charges and encumbrances and not subject to any adverse claims. The undersigned will, upon request, execute any additional documents deemed by the Purchaser necessary or desirable to complete the sale, assignment and transfer of the aforescribed Shares. All authority herein conferred or agreed to be conferred shall survive the death or incapacity of the undersigned and any obligation of the undersigned hereunder shall be binding upon the heirs, personal representatives, successors and assigns of the undersigned. Except as stated in the Offer to Purchase, this tender is irrevocable.

SPECIAL PAYMENT INSTRUCTIONS

SPECIAL DELIVERY INSTRUCTIONS

A 4349

To be completed ONLY if unpurchased Shares and/or check is to be issued in the name of and sent to someone other than the undersigned.

Issue and mail check to:

Name .....
(Please Print)

Address .....

.....
(Include Zip Code)

To be completed ONLY if unpurchased shares and/or check, issued in the name of the undersigned, are to be sent to someone other than the undersigned.

Mail check and/or Shares, issued in the name of the undersigned, to:

Name .....
(Please Print)

Address .....

.....
(Include Zip Code)

EX-12S
2-25

TO BE USED ONLY IF CERTIFICATES ARE NOT TRANSMITTED HEREWITH

The undersigned, guarantees to deliver to the Depositary certificates for the Shares tendered by this Letter of Transmittal in proper form for transfer within four business days after the earlier of (a) the Expiration Date (as defined in the Offer to Purchase) or (b) notification of the purchase of such Shares.

☐ a member of a national securities exchange,

☐ a United States commercial bank or trust company,

.....
(Firm—Please Print)

.....
(Authorized Signature)

.....

.....
(Address)

.....
(Area Code and Telephone Number)

NAME AND ADDRESS OF BROKER, DEALER OR COMMERCIAL BANK OR TRUST COMPANY WHICH SOLICITED TENDER

The undersigned represents that the securities broker or dealer or commercial bank or trust company that solicited and obtained this tender is:

Name .....
(Please Print)

Address .....

.....

The acceptance of compensation by such securities broker or dealer or such commercial bank or trust company will constitute a representation that such person has not engaged in any activity prohibited by the Securities Exchange Act of 1934 or the applicable rules and regulations thereunder in connection with such solicitation, and that such firm is entitled to such compensation in accordance with the provisions of the Offer to Purchase.

SIGN HERE

.....

.....
(Signature(s) of Owner(s))

(Must be signed by registered holder(s) exactly as name(s) appear in certificate(s), or by person(s) authorized to become registered holder(s) by certificate(s) and documents transmitted herewith.)

Name(s): .....
(Please Print)

Address: .....

.....

Telephone Number: .....
(Include Area Code)

☞ Signature(s) Guaranteed: .....
(See Instruction 7) (Authorized Signature)

.....

Dated: .....

(DO NOT WRITE IN SPACES BELOW)

Received ..... Accepted By ..... Checked By .....

Box No.	Shares Tendered	Shares Accepted	Check Nos.	Amount of Check	Shares Returned	Certificate No.
				Gr. ..... Tax ..... Net		

Form Prepared By ..... Checked By ..... Dated .....

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2-26

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INSTRUCTIONS

Forming Part of Terms and Conditions of the Offer to Purchase

1. This Letter of Transmittal must be properly filled in and signed by the registered owner or owners of the Shares represented by the certificate(s) and mailed or delivered with such certificate(s) to the Depositary at the following address:

By mail:

FIRST NATIONAL CITY BANK
Special Corporate Services Department
P. O. Box 447
Church Street Station
New York, New York 10008

By Hand:

FIRST NATIONAL CITY BANK
Special Corporate Services Department
111 Wall Street
3rd Floor
New York, New York

The method of delivery of all documents is at the option and risk of the shareholder, but if delivery is by mail, registered or insured mail is suggested.

2. Inadequate Space. If the space provided on the reverse side is inadequate, the certificate numbers and numbers of Shares should be listed on a separate schedule affixed hereto.

3. Partial Tenders. If less than all of the Shares which are evidenced by any certificate enclosed herewith are desired to be tendered, fill in the number which you actually wish to tender in the box which is entitled "No. of Shares Tendered." A new certificate for the remainder of the Shares which were evidenced by your old certificates will be sent to you promptly after the expiration of the Offer to Purchase. All Shares represented by certificates listed are tendered unless otherwise stated.

4. Signatures on Letter of Transmittal, Stock Powers, and Endorsements. If this Letter of Transmittal is signed by the registered owner of the certificates transmitted herewith, the signatures must correspond with the name as written on the face of the certificates without alteration, enlargement or any change whatsoever.

If the transmitted certificates are owned of record by two or more joint owners, all such owners must sign this Letter of Transmittal.

If this Letter of Transmittal is signed by trustees, executors, administrators, guardians, attorneys-in-fact, officers of corporations or others acting in a fiduciary or representative capacity, such persons should so indicate when signing, and proper evidence of their authority so to act must be submitted.

When the Letter of Transmittal is signed by the registered holder of the certificates transmitted herewith, no endorsements of certificates or separate stock powers are required unless the check is to be made payable to, or any unpurchased Shares are to be registered in the name of, a person other than the registered holder. If the Letter of Transmittal is signed by a person other than the registered holder of the certificates transmitted herewith, the certificates must be endorsed or accompanied by appropriate stock powers, in either case signed exactly as the name or names of the registered owner or owners appear on the certificates. If certificates or stock powers are signed by trustees, executors, administrators, guardians, attorneys-in-fact, officers of corporations or others acting in a fiduciary or representative capacity, such persons should so indicate when signing, and proper evidence of their authority so to act must be submitted. Signatures on stock certificates or separate stock powers required by this paragraph of this Instruction 4 must be guaranteed by a commercial bank or trust company having an office or correspondent in New York City or by a member of any national securities exchange.

5. Special Payment and Delivery Instructions. Indicate the name and address to which payment for your Shares, or certificates for those of your Shares to be returned, are to be sent, if different from the name and address of the person(s) signing this Letter of Transmittal as shown at the foot hereof.

If payment is to be made to a person other than the registered holder, or certificates for any Shares not purchased are to be issued or sent to the registered holder, any necessary transfer tax stamps must be affixed to the certificates. If such stamps are not affixed, the Depositary will purchase them and deduct

Ex-12.5-
2-27

Except as provided in this Instruction, it will not be necessary for transfer tax stamps to be affixed to the certificates transmitted with this Letter of Transmittal.

6. Soliciting Brokers, Dealers, Banks or Trust Companies. Identify the broker or dealer or the commercial bank or trust company, if any, which solicited and obtained your tender.

7. Guaranty of Signatures. Signatures on this Letter of Transmittal must be guaranteed by a commercial bank or trust company [redacted] or by a member of any national securities exchange unless the Shares tendered with this Letter of Transmittal are tendered for the account of any of the foregoing.

IMPORTANT: THIS LETTER OF TRANSMITTAL MUST BE RECEIVED BY THE DEPOSITARY, OR NOTICE OF DEPOSIT WITH A MEMBER OF ANY NATIONAL SECURITIES EXCHANGE OR A UNITED STATES COMMERCIAL BANK OR TRUST COMPANY (AS PROVIDED IN SECTION 4 OF THE OFFER TO PURCHASE) MUST BE RECEIVED BY THE DEPOSITARY, PRIOR TO 6:00 P.M., NEW YORK TIME, ON DECEMBER 21, 1973, UNLESS THE OFFER IS EXTENDED.

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EXHIBIT T-11

CHAS. F. YOUNG COMPANY / 75 VARICK STREET / NEW YORK / 212 431-0300

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Proof of December 9, 1973

EX-12a
2-27

BOC FINANCIAL CORPORATION

OFFER TO PURCHASE

3,000,000 COMMON SHARES

OF

AIRCO, INC.

For Cash at $20.00 Per Share Net

OFFER EXPIRES DECEMBER 21, 1973

TO BROKERS, DEALERS, BANKS, TRUST COMPANIES AND NOMINEES:

BOC Financial Corporation, a Delaware corporation (the "Purchaser"), is offering to purchase 3,000,000 of the outstanding common shares (the "Shares") of Airco, Inc., a New York corporation ("Airco"), at $20.00 per Share net to the seller, in cash. The detailed terms and conditions of the offer are set forth in the enclosed Offer to Purchase and Letter of Transmittal. The offer will terminate at 6:00 P.M., New York Time, on December 21, 1973, unless extended.

Enclosed for forwarding to your clients are copies of each of the following documents:

1. Letter from Airco transmitting the Offer to Purchase.
2. Offer to Purchase.
3. Letter of Transmittal.
4. Form of letter to your clients for whom you hold Shares registered in your name.

The form of letter to your clients has an attachment thereto for obtaining each such client's instructions with reference to the Offer.

Each member of a national securities exchange or of the National Association of Securities Dealers, Inc., or any foreign broker or dealer that agrees to conform to the Rules of Fair Practice of such Association in soliciting acceptances in the United States, or any commercial bank or trust company, the name of which appears in the appropriate space in the Letter of Transmittal accompanying a tender, will be paid a solicitation fee of $.50 for each Share ~~s~~ tendered which is purchased by the Purchaser. If one or more of your customers own any Shares, it is suggested that you contact them.

Acceptance of compensation by you for soliciting tenders will constitute your representation and agreement that (i) you have complied and will comply with the applicable requirements of the Securities Exchange Act of 1934, as amended, and the applicable rules and regulations thereunder in connection with such solicitation, (ii) in soliciting tenders you have used no soliciting materials other than those referred to above which have been furnished to you, (iii) you are entitled to such compensation under the terms of the Offer to Purchase, and (iv) if you are a foreign dealer, you have agreed as stated above to conform to the Rules of Fair Practice of the National Association of Securities Dealers, Inc. in making solicitations in the United States.

BEST COPY AVAILABLE

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(8349 C)

Additional copies of the enclosed material may be obtained from the following:

EX-12(E)-2-29

Dealer Manager:

LAZARD FRÈRES & Co.

Attention: Syndicate Department
One Rockefeller Plaza, 31st Floor
New York, New York 10020
(212) 489-6600, Ext. 325
(Call Collect)

Soliciting Agent:

THE KISSEL-BLAKE ORGANIZATION, INC.
50 Broadway
New York, New York 10004
(212) 344-6733
(Call Collect)

Nothing herein or in the enclosed documents shall constitute you the agent of either the Purchaser or the Dealer Manager or authorize you to make any statements on behalf of the Purchaser or the Dealer Manager with respect to the Offer to Purchase, other than the statements specifically set forth therein.

Yours very truly,

LAZARD FRÈRES & Co.

December 10, 1973

A 4354

(83299) Proof of December 9, 1973

BOC FINANCIAL CORPORATION

EX-125-
2-30

OFFER TO PURCHASE

3,000,000 COMMON SHARES

OF

AIRCO, INC.

For Cash at $20.00 Per Share Net

OFFER EXPIRES DECEMBER 21, 1973

To Our Clients:

Enclosed for your consideration is an Offer to Purchase dated December 10, 1973, by BOC Financial Corporation, a Delaware corporation (the "Purchaser"), together with a form of Letter of Transmittal. This material is being forwarded to you as the beneficial owner of shares of common stock (the "Shares") of Airco, Inc., a New York corporation, carried by us in your account but not registered in your name. A tender of such Shares may be made only by us as the holder of record and only pursuant to your instructions.

Accordingly, we request instructions as to whether you wish us to tender any or all of such Shares held by us in your account, pursuant to the terms and conditions set forth in the Offer to Purchase and Letter of Transmittal.

Your instructions to us should be forwarded as promptly as possible in order to permit us to submit a tender on your behalf in accordance with the provisions of the Offer to Purchase, which Offer to Purchase terminates at 6:00 P.M., New York Time, on December 21, 1973, unless extended.

Your attention is invited to the following:

1. The price is $20.00 per Share net to the seller in cash.

2. Commissions, fees and transfer taxes (on the transfer to the Purchaser) in connection with the tender will be paid by the Purchaser.

If you wish to have us tender any or all of your Shares, will you kindly so instruct us by completing, executing, detaching and returning to us the instruction form set forth below. If you authorize tender of your Shares, all your Shares will be tendered unless otherwise specified below. The Letter of Transmittal is furnished to you for your information only and should not be used to tender Shares.

INSTRUCTIONS

The undersigned acknowledge(s) receipt of your letter enclosing the Offer to Purchase 3,000,000 common shares (the "Shares") of Airco, Inc., a New York corporation, by BOC Financial Corporation, a Delaware corporation, dated December 10, 1973, and the other documents referred to in your letter.

This will instruct you to tender the number of Shares indicated below held by you for the account of the undersigned, pursuant to the terms and conditions set forth in the Offer to Purchase and the Letter of Transmittal.

Number of Shares to be Tendered*:

.....

* Unless otherwise stated, this is an instruction to tender all of the Shares held for the account of the undersigned.

SIGN HERE

.....

.....

(Signature(s))

Name(s): .....

.....

(Please Print)

Address(es): .....

.....

Date: .....

EX-125-
Z-31

BRITISH OXYGEN OFFERS TO PURCHASE
3,000,000 AIRCO SHARES AT $20.00

The British Oxygen Company Limited announced today that it is making a tender offer, through its subsidiary BOC Financial Corporation, to purchase any and all shares up to 3,000,000 shares, or approximately 26% of the outstanding shares, of Airco, Inc., at a price of $20 per share net. The offer will expire on December 31, 1973, but BOC Financial may extend the tender period from time to time and may accept shares tendered in excess of 3,000,000 up to a maximum of 4,000,000. The offer is being transmitted to Airco's shareholders with the cooperation of Airco and the consent of its Board of Directors.

Lazard Freres & Co. will act as Dealer Manager for the offer and First National City Bank will act as Depositary for the tendered shares. Dealers who solicit tenders of Airco shares will receive from BOC Financial a fee of $.50 per share tendered and accepted (with no maximum per account).

British Oxygen is engaged in the manufacture of industrial, medical and rare gases, welding equipment, chemicals, special metals, air separation equipment, medical equipment, aircraft breathing systems, cryogenic systems and equipment, vacuum equipment and instrumentation and food products.

CONFIDENTIAL

July 24, 1973

A 4356

EX-(37-A

CHECKLIST FOR AIRCO/BOC DISCUSSIONS - JULY 25-27, 1973

I. Preliminary Matters

A. Airco/BOC confidentiality agreement

B. Agenda/timetable for July 25-27, 1973 meetings

II. Preliminary Overview of Amalgamation Possibilities

A. Commercial evaluation -

Business/operational fit

Present opportunities/problems (commercial/technical

Enhancement opportunities (commercial/technical)

Scope of (exclusions from) possible amalgamation

Personnel benefits/policies

B. Valuation considerations -

Relative market values of presently traded securities

Relative asset/book values

Recent earnings performances

Earnings prospects

Technical capabilities/developments and patent positions.

£/$ relative values

III. Legal Considerations - Governmental and Other Approvals/ Consents/Consultations

A. Antitrust trade regulation (U.S.,U.K.,E.E.C.)

Present relationships

Horizontal marketing overlaps - actual/potential

Vertical potentialities

Conglomerate potentialities

CONFIDENTIAL

EX-127-B

CHECKLIST FOR AIRCO/BOC DISCUSSIONS
JULY 25-27, 1973

B. Securities registration/regulation/listings (U.S.,U.K.,E.E.C.)

C. Other governmental approvals

Bank of England

OFDI

UK Department of Trade and Industry

Any needed U.S. Defense, Atomic Energy, State, Commerce, Treasury Department clearances as to classified or otherwise regulated information and as to government contracts

Any needed tax rulings (see also tax considerations)

D. Shareholder approval/notification (Airco, BOC)

Shareholder meeting(s)

U.K. Stock Exchange (?) requirement of notice to BOC shareholders

E. Consents/rights of lenders/debentureholders

F. Other consents

Major contracts/licenses/leases/policies

Third country governmental authorities

G. Labor unions

Possible reactions

Possible approaches

H. Third party shareholdings in subsidiaries

Identify

Possible problems

I. Tax considerations (U.S.,U.K.)

Forms of amalgamation

Effects on Airco, BOC and subsidiaries

Effects on shareholders of Airco, BOC

Rulings needed or desirable

Specific taxes

Income/capital gains (U.S.,U.K.) - general

New U.K. advance corporation tax

U.K. stamp duty

U.S. interest equaliztion tax

J. Pending/proposed legislation/regulations

Trade bill (U.S.)

Tax (U.S.)

U.K.

IV. Organization/Structure of Amalgamated Enterprises

A. Management philosophy and structure

Unified vs. segmented top-level control

Centralized vs. decentralized operating authority

Board(s) of Directors vs. Board/Management

operating, finance and other committee(s)

Composition of Board and Board Management committee
Structure and authority of operating units
Structure and authority of staff units.

B. Corporate/management structure of amalgamated enterp
Single vs. dual parentage
Unified vs. bi-polar management
Ease of financing for single publicly traded paren
vs. flexibility of financing for dual publicly traded holding companies

C. Financial structure of amalgamated enterprise(s)
Debt/equity ratio goals
Classes of common/ordinary and preference shares
Debt structure/consolidation

D. Stock exchange listings (worldwide)

V. Means of Amalgamation

A. Merger/consolidation/amalgamation of parents or subsidiaries

B. Public tender for Airco or BOC shares

C. Airco and BOC swap of shares of subsidiaries (bi-polar joint venture)

D. Acquisition by Airco or BOC of assets or stock of sc operating subsidiary of other

CONFIDENTIAL

E. Joint venture through acquisition by Airco or BOC of portion of shares of sole operating subsidiary of other

F. Other

VI. Future Conduct of Negotiations/Investigations

A. Conduct of negotiations

Scope

Aims

Spirit (restricted communication vs. full candor)

Procedure (level of and participation in next meeting or series of meetings, etc.)

Pace (timetable)

Assignments

B. Scope/timing of Airco/BOC investigations of each other's affairs

Financial

Legal

Technical/Operational

Personnel benefits/policies

Other

C. Restraints on Airco/BOC during pendancy of negotiations

Issuing/purchasing/redeeming shares or other securities

Borrowing

Dividends and other distributions

Disposition/acquisition/encumbrance of assets

Management/employment/service agreements

Other transactions not in ordinary course

Negotiating with third parties regarding amalgamation or other first magnitude transactions

D. Preconditions to amalgamation - other than as included above

E. Public announcements

Avoidance of communications/leaks which may trigger need for announcement

Procedures to assure such avoidance

Coordination of announcements

DMM:db

A 4362

CX-130

FRASER SWEATMAN INCORPORATED PRODUCTS FOR ANESTHESIA

Fraser Sweatman Incorporated

5470 Broadway, Lancaster, N. Y. 14086 Area 716-684-0554

ASSOCIATED COMPANIES

Fraser Sweatman (Canada) Ltd.
36 Molloy Road, Scarborough 705, Ontario, Canada
Area 416-752-1770

Cyprane Limited
West Lane, Keighley Yorkshire, England

A 4363

QUANTIFLEX R.F.

Right Frame Anesthesia Machine

Ex-131-A

This brochure is for use of Physicians and Authorized Hospital Personnel.

PRECISION COMPONENTS
FLEXIBILITY OF TECHNIQUES
SIMPLICITY OF OPERATION

The Quantiflex Anesthesia Machine has been created with a view toward combining simplicity with versatility—functional design with quality materials—easy selection by the anesthesiologist of the right combination of gaseous and volatile agents—delivered using non-rebreathing or rebreathing systems to conveniently suit his immediate purpose and technique.

This is an age of rapid change, the Quantiflex is designed to accommodate the demand for flexibility of agent and technique while maintaining simple and uncomplicated methods of operation.

The individually calibrated flow and temperature compensated Cyprane vaporizers along with the 10 to 1 ratio "Twin-Series" tube Flowmeters combine precision components, flexibility of techniques, and simplicity of operation to provide the precise requirements of quantitative anesthesia.

Fraser Sweatman Incorporated

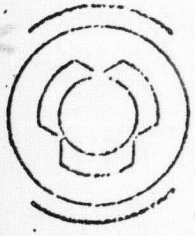
5490 Broadway, Lancaster, N.Y. 14086 Area 716 684 0504

ASSOCIATED COMPANIES

Fraser Sweatman (Canada) Ltd.
56 Malley Road, Scarborough 705, Ontario, Canada, Area 416 752 1752

Cyprane Limited
West Lane, Keighley Yorkshire, England

A 4364



Cross Section
Flowmeter Tube

"When you can measure what you are talking about and express it in numbers, you know something about it. But when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of a science."

—Lord Kelvin

CX-131-B

"TWIN SERIES" FLOWMETERS ARE THE HEART OF THE QUANTIFLEX—THE QUANTIFLEX 16" FLOWMETER SYSTEM WITH 10:1 RATIO

Each gas in the Quantiflex Flowmeter System has two adjacent 10" tapered tubes connected in series.

The full usable scale length is 16"—the longest usable scale length on any Anesthesia Machine.

In addition, the Quantiflex Flowmeter System is the only one employing a ratio of 10:1 (the minimum flow shown on each tube is exactly 1/10th the maximum). This increases the scale length again and therefore, readability.

Each pair of flowmeters, consisting of a fine flow tube and a coarse flow tube, is controlled by a single needle valve.

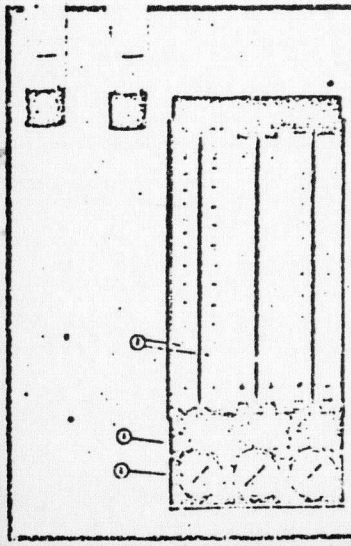
In the upper two-thirds of the scale of each tube the accuracy is plus or minus 2% of setting, and in the lower one-third of each tube the accuracy is plus or minus 5% of setting. There is no cramping of the scale at lower settings, a fact which the Anesthesiologist will appreciate when setting metabolic flow rates for oxygen.

Each flowmeter scale is permanently fused directly onto the tapered glass tube. When cleaning tubes, therefore, there is no possibility of the scale becoming separated and attached to the wrong tube.

The synthetic sapphire floats are mechanically centered on three guides, as shown in the cross section, which are moulded into the interior taper of the tube to mechanically center the float. Variation in floor level which would cause a flowmeter tube to shift from the perpendicular will never affect the setting materially.

For nitrous oxide and oxygen in both fine and coarse tubes all floats are interchangeable. All floats are also interchangeable with new tubes. The matching of tube—to float—to scale has been eliminated on the Quantiflex. Each sapphire float is colored silver on part of the float and its rotation in the tube is a positive indication of flow.

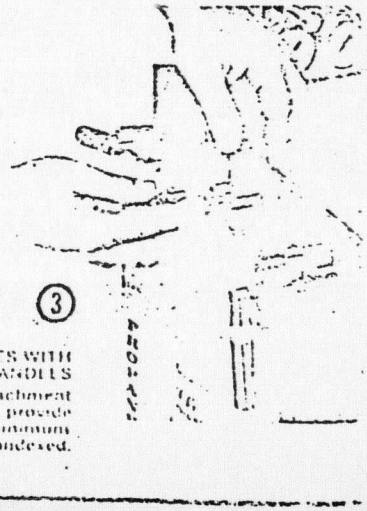
All tubes are protected by a plastic cover from inadvertent damage.



① CENTRALIZED GROUPING OF CONTROLS The needle valves (A), twin flowmeter tubes (B), and pressure gauge (C) are grouped together for each gas. A glance at the pressure gauge will show the amount of pressure remaining in the cylinder; each pair of flowmeters is operated by a single needle valve control. Centralizing of twin series flowmeters, needle valve and pressure gauge avoids confusion.

② QUANTIFLEX NEEDLE VALVES

Combine handle, stem, body and silver seat in single assembly. Each valve handle is color coded and located beneath the flowmeter for the corresponding gas. The handle acts as a stop to prevent seat damage and can be readjusted to compensate for wear. If service is required, the entire valve assembly can be easily removed and replaced.



③ SWIVEL GATE YOKES WITH VISE-TYPE TOGGLE HANDLES

Permit direct and convenient entry for attachment of the cylinder valve. Vise type toggle handles provide quick, easy and firm cylinder seal with minimum effort and strength. All yokes are pin indexed.

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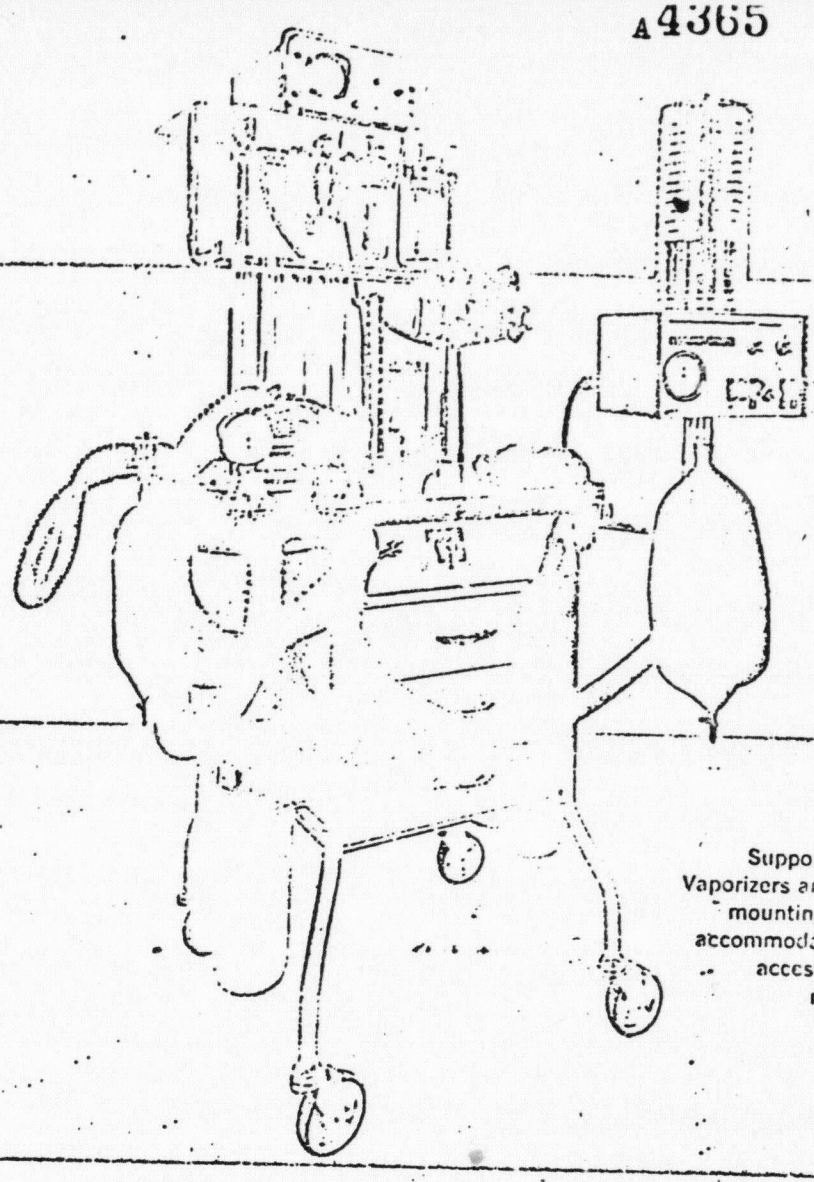
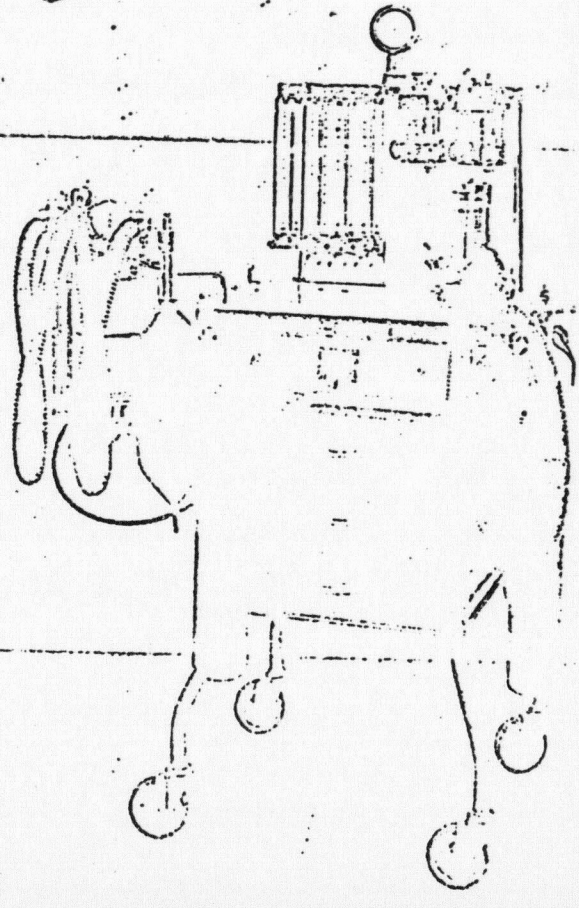
CX-131-C



103530
Quantiflex Rigid Frame, 3 gas, 5 yoke, 3 drawer shown with shelf and monitor—Ventilator, Blood Pressure Manometer, FS 68 Absorber, and Optional Vaporizers.

FLEXIBLE SUPERSTRUCTURE

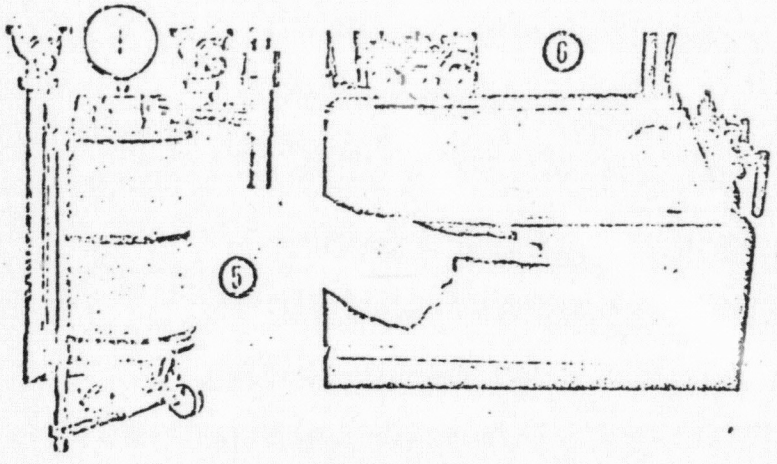
Supports QUANTIFLEX "Twin-Series" Flowmeters, Vaporizers and other accessories. Main uprights support mounting crossbars that can be easily positioned to accommodate added Vaporizers, Flowmeters and other accessories, i.e., manometer, suction equipment, respirator, monitor shelf above five ft. level.

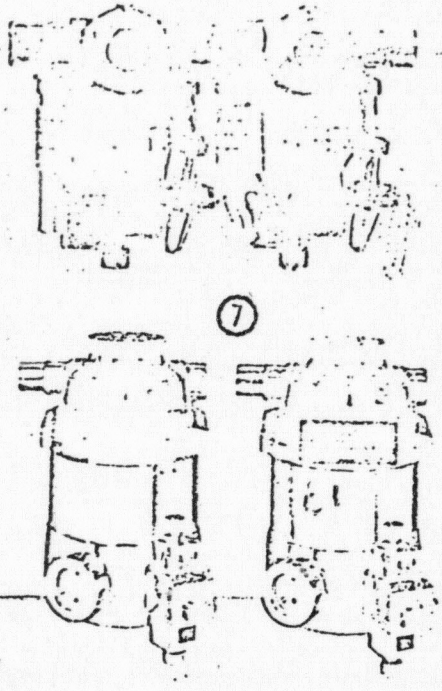


103330
QUANTIFLEX Rigid Frame, 3 gas, 3 yoke, 3 drawer shown with FS 68 Absorber, Fluotec Mark III, Pentec Mark II, Concentrator Vaporizer and Aneroid Manometer.

A 4366

EX-121-D





(5) FS-63 ABSORBER

Solid brass construction—heavily chrome plated. Single action cam type lever allows large capacity, twin-canister to be changed easily and rapidly. Canisters are interchangeable and transparent.

A large, easy view pressure manometer is provided along with an adjustable pressure relief valve—3 to 30 mm. Hg.

Available with or without exhalation and inhalation check valves.

A conveniently located drain cock is provided. The Absorber mount is adjustable for height with single easy action clamp. Handle—15" range.

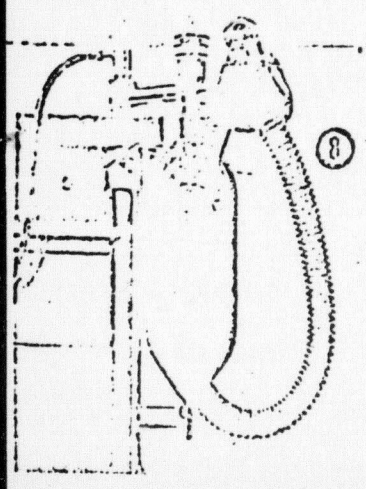
(6) OXYGEN FLUSH—Provides 60 LMP flow from cylinders or pipeline supply. Automatic shut-off. Flush button is located at front of the machine, with a guard, to prevent accidental operation.

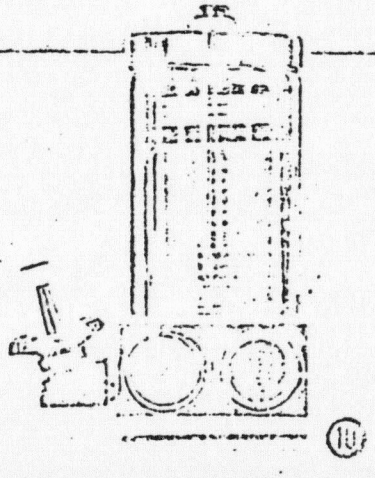
(7) FLUOTEC AND PENTEC VAPORIZERS—Especially adaptable to the QUANTIFLEX. The addition of any number of Vaporizers is easily accomplished by a simple attachment to the modular superstructure.

(8) OPEN CIRCUIT SYSTEM MOUNT—A convenience mount for Magill type non-rebreathing systems is provided. The open circuit mount for non-rebreathing techniques can be mounted on the absorber elevating post and raised for convenience.

(9) DELIVERY TUBE—Provides single outlet for anesthetic mixture. The tube has a tapered slip-on connection providing rapid and single change from non-rebreathing to rebreathing systems.

(10) CONCENTRATOR VAPORIZER—Also available as a built-in accessory with separate "TWIN-SERIES" Flowmeter—calibrated 10cc to 100cc on fine tube and 100cc to 1000cc on coarse tube—side fill to prevent overfilling, liquid level sight glass, and thermometer. Three position Vaporizer control is located at front of the machine—"ON"—"OFF"—"O_2 FLUSH".



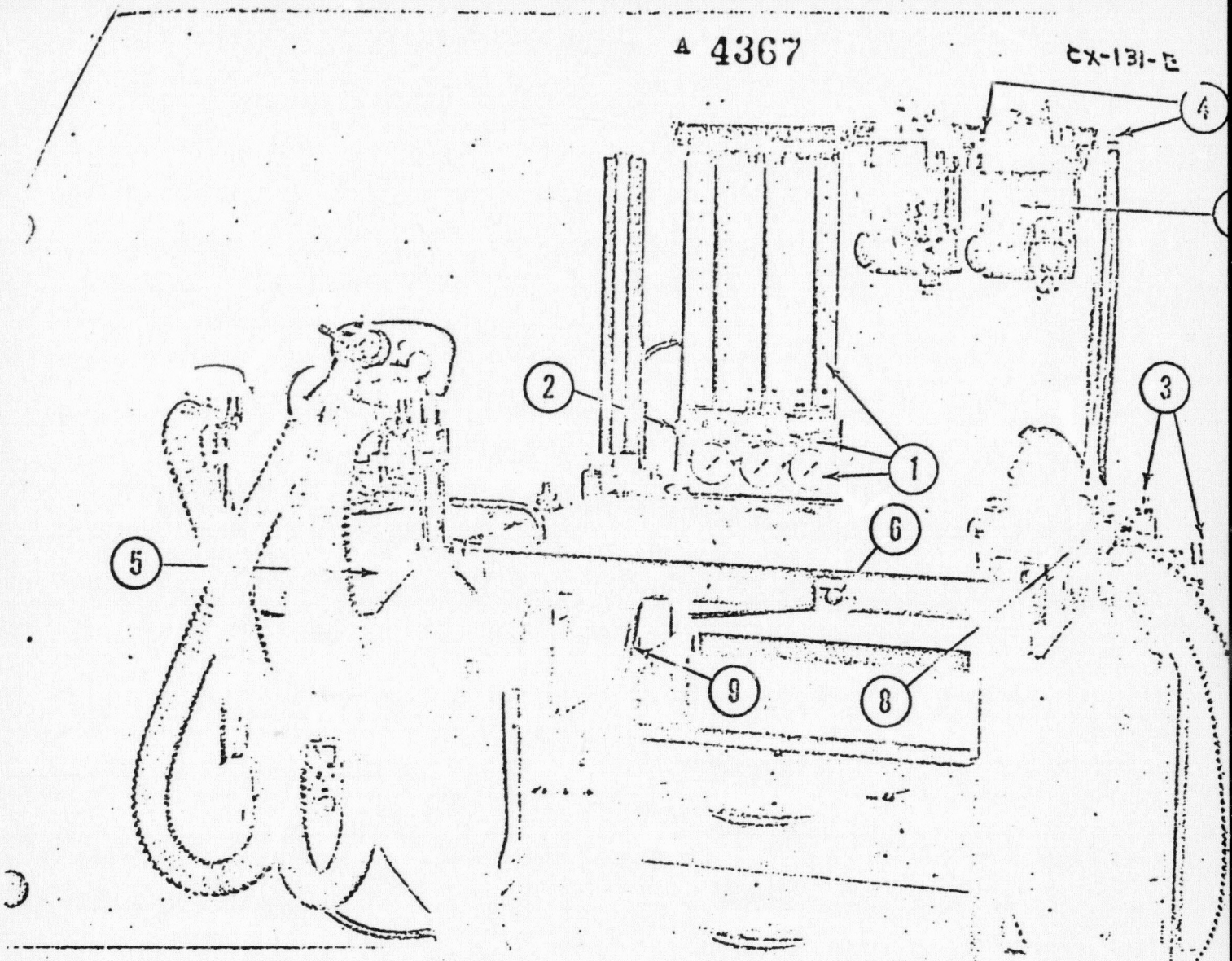


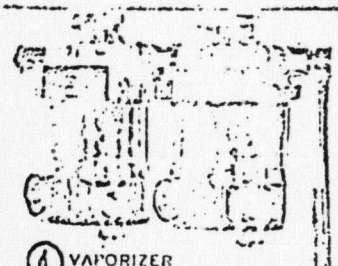
TWO STAGE REGULATORS—Supplied for all high pressure gases to provide constant flow regardless of cylinder pressure changes. Provides safety in darkened areas such as X-ray and fluoroscopy.

OXYGEN FAIL-SAFE—The Oxygen Fail-Safe is standard equipment on all Quantiflex Anesthesia Machines. This safety system prevents gases from flowing unless oxygen pressure is available. If oxygen pressure fails or is disconnected for any reason, all gases automatically shut off. System is designed to eliminate possibility of leakage or dilution of gases.

A 4367

CX-131-E





(4) VAPORIZER MOUNTING

The super structure of the Quantiflex incorporates two upright ⅞" chrome plated brass tubes. Its structure permits the addition of ventilators, extra flowmeter tubes and vaporizers. The Quantiflex can be "customized" to suit the individual requirements of the anesthesiologist.

103530 Quantiflex Rigid Frame, 3 cas, 5 yoke, 3 drawer shown with ES.C.S. Absorber, Fluotec Mark III, Fortec Mark II Vaporizers and mercury B.P. Manometer.

QUANTIFLEX RIGID FRAME MODELS

A 4368

models include: 2 flowmeters 10:1 ratio, 1 bar, 1 course for each gas; oxygen fail safe system; two stage regulator for each high pressure gas; open front system; swivel gate yokes; toggle handles, modular mounting facilities; adjustable absorber mount, 20" w. x 18" d. stainless steel table top; contrastive baked enamel finish.

QUANTIFLEX STOCK NUMBERS AND DESCRIPTION

Stock No.	Description
102410	Quantiflex R.F., 2 gas, 4 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
102430	Quantiflex R.F., 2 gas, 4 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
102210	Quantiflex R.F., 2 gas, 1 yoke each gas, 1 drawer, DISS fittings for O_2, N_2O
102230	Quantiflex R.F., 2 gas, 1 yoke each gas, 3 drawer, DISS fittings for O_2, N_2O
103510	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 5 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
103511	Quantiflex R.F., 3 gas, O_2, N_2O, Air, 5 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
103512	Quantiflex R.F., 3 gas, O_2, N_2O, He, 5 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
103513	Quantiflex R.F., 3 gas, O_2, N_2O, CO_2, 5 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
103514	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 5 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
103530	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 5 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
103531	Quantiflex R.F., 3 gas, O_2, N_2O, Air, 5 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
103532	Quantiflex R.F., 3 gas, O_2, N_2O, He, 5 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
103533	Quantiflex R.F., 3 gas, O_2, N_2O, CO_2, 5 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
103534	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 5 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
103310	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 3 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
103311	Quantiflex R.F., 3 gas, O_2, N_2O, Air, 3 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
103312	Quantiflex R.F., 3 gas, O_2, N_2O, He, 3 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
103313	Quantiflex R.F., 3 gas, O_2, N_2O, CO_2, 3 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
103314	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 3 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
103330	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 3 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
103331	Quantiflex R.F., 3 gas, O_2, N_2O, Air, 3 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
103332	Quantiflex R.F., 3 gas, O_2, N_2O, He, 3 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
103333	Quantiflex R.F., 3 gas, O_2, N_2O, CO_2, 3 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
103334	Quantiflex R.F., 3 gas, O_2, N_2O, C_2H_4, 3 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
104611	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, Air, 6 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
104612	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, He, 6 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
104613	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, CO_2, 6 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
104614	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, C_2H_4, 6 cylinder yokes, 1 drawer, DISS fittings for O_2, N_2O
104631	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, Air, 6 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
104632	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, He, 6 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
104633	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, CO_2, 6 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
104634	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, C_2H_4, 6 cylinder yokes, 3 drawer, DISS fittings for O_2, N_2O
104411	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, Air, 4 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
104412	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, He, 4 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
104413	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, CO_2, 4 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
104414	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, C_2H_4, 4 yoke pipeline model, 1 drawer, DISS fittings for O_2, N_2O
104431	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, Air, 4 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
104432	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, He, 4 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
104433	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, CO_2, 4 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O
104434	Quantiflex R.F., 4 gas, O_2, N_2O, C_2H_4, C_2H_4, 4 yoke pipeline model, 3 drawer, DISS fittings for O_2, N_2O

FS-68 MODEL ABSORBERS

Stock No.	Description
350501	Model FS-68 Absorber, single canister with dome type directional valves
350502	Model FS-68 Absorber, double canister with dome type directional valves
350503	Model FS-68 Absorber, single canister (without dome type directional valves)
350504	Model FS-68 Absorber, double canister (without dome type directional valves)

FS-68 ABSORBER ASSEMBLIES

Stock No.	Description
350509	FS-68 Absorber, single canister, with dome type directional valves, including: 2-35" breathing tubes, 1-3.5 liter square rebreathing bag, 1-size 4 mask, 1-size 5 mask, 1-adult head harness, FS inhaler "Y"
350510	FS-68 Absorber, double canister with dome type directional valves including: rubber accessories, same as above
350511	FS-68 Absorber, single canister without dome type directional valves including: 2-35" breathing tubes, 1-3.5 liter square rebreathing bag, 1-size 4 mask, 1-size 5 mask, 1-adult head harness, FS inhaler "Y"
350512	FS-68 Absorber, double canister without dome type directional valves including: rubber accessories, same as above

ABSORBER ACCESSORIES

Stock No.	Description
250501	No. 8 Ether Vaporizer adapter for FS-68 Absorber
150507	Ohio No. 8 Ether Vaporizer
150501	Volumeter*
150504	Volumeter adapter for Ohio #20 and FS-65 Absorber
150505	Volumeter adapter for Foregger Jumbo Absorber
150502	Combination 8 day clock Pulse counter, Respiration counter, Sphygmomanometer
150503	Sphygmomanometer
150505	Adapter for mounting clock and Sphygmomanometer combination on FS-68 Absorber
150508	Gasket, center, for Baralyme* Disposable Canister

VAPORIZERS AND ACCESSORIES

Stock No.	Description
57605	Fluotec Mark III, 0.5% to 5.0% @ 1/2% intervals
57505	Fluotec Mark III, 0.5% to 5.0% @ 1/2% intervals with FS Pin Safety System
47603	Fluotec Mark II, 0.5% to 3.0% @ 1/10% intervals* †
47503	Fluotec Mark II, 0.5% to 3.0% @ 1/10% intervals with FS Pin Safety System*
47601	Fluotec Mark II, 0.5% to 4.0% @ 1/2% intervals †
47504	Fluotec Mark II, 0.5% to 4.0% @ 1/2% intervals with FS Pin Safety System
48615	Tritec, 0.5% to 1.5% @ 1/10% intervals* †
48515	Tritec, 0.5% to 1.5% @ 1/10% intervals with FS Pin Safety System*
49603	Chlorotec, 0.5% to 4.0% @ 1/2% intervals* †
49504	Chlorotec, 0.5% to 4.0% @ 1/2% intervals with FS Pin Safety System*
82603	Pentec Mark II, 0.35% to 2.0% @ 1/2% intervals, maximum setting approximately 3.0% at room temperature
82503	Pentec Mark II, 0.35% to 2.0% @ 1/2% intervals, maximum setting approximately 3.0% at room temperature, with FS Pin Safety System
82615	Pentec Mark I, 0.5% to 1.5% @ 1/2% intervals †
82515	Pentec Mark I, 0.5% to 1.5% @ 1/2% intervals with FS Pin Safety System
81604	Azeotec, 0.5% to 4.0% @ 1/2% intervals** †
33610	Fluromartec, 0.5% to 10% @ 1/2% intervals** †
33510	Fluoromartec, 0.5% to 10% @ 1/2% intervals with FS Pin Safety System
351310	Concentrator Vaporizer (with thermometer)
151300	Heidbrink #10 Vaporizer
151301	Heidbrink #8 Vaporizer
151302	500 Boyle Ether Vaporizer
151303	Baumanometer, Mercury Blood Presure Manometer
151304	Mounting bracket, Baumanometer to Quantiflex R.F.
150503	Sphygmomanometer
151305	Mounting bracket, Sphygmomanometer to Quantiflex R.F.
151306	Ventilator power outlet
151307	Non-Rebreathing face mount
151308	Steen Pressure Relieving Valve
151309	Fromm Non-Rebreathing valve

*Trademark

**Trademark Azeotec, Inc., New Canaan

†Trademark Ohio Chemical & Surgical Equipment Co. Trademark Fluotec Mark II, Chlorotec, Pentec, Fluromartec, Fluoromartec, Tritec, Azeotec, Concentrator Vaporizer, Heidbrink, Boyle, Baumanometer, Sphygmomanometer, Steen, Fromm, Ventilator, Stewart-Warner Corporation, Stewart-Warner Alemite Corporation, Stewart-Warner National Cylinder Gas, Division of Chemetron Corp.

BEST COPY AVAILABLE

SPECIFICATIONS

Provide an anesthetic machine to include a combination of flowmeters, needle valves, valves, modular mounting facilities for vaporizers, flowmeters and absorber.

The unit shall be equipped with two 10" series flowmeter tubes calibrated for 10 to 1 ratio control for fine flow and four tube course flow for each gas. The flowmeters shall be mounted by means of safety and pressure relief valves for location on a contoured control panel. The control panel shall also be provided with a cylinder gauge for each gas. An oxygen fail safe system shall be provided for all gases. Low pressure regulators for each high pressure gas shall be provided. Gauges to be readily accessible for operation.

The machine shall be placed into operation by a single connection and at all four corners of the machine.

The frame shall be of all welded construction with a base area not to exceed 22" x 24" with a stainless steel table top 18" deep by 20" wide, with rounded finishes, to be contrastive baked enamel. Casters 5" in diameter and double race ball bearing capable of 200# swivel shall be provided.

The anesthesia machine shall be equipped for administration of gases as follows: oxygen, nitrous oxide, ethylene, helium, cyclopropane, carbon dioxide, and with a double valve Safety System [illegible]

A 4369

Fluotec Mark II

vaporizers

A 4370

CX-132-B

"When you can measure what you are talking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of a science."

—LORD KELVIN

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®FLUOTHANE (Halothane) is available in the United States through Ayerst Laboratories by arrangement with Imperial Chemical Industries, Ltd.

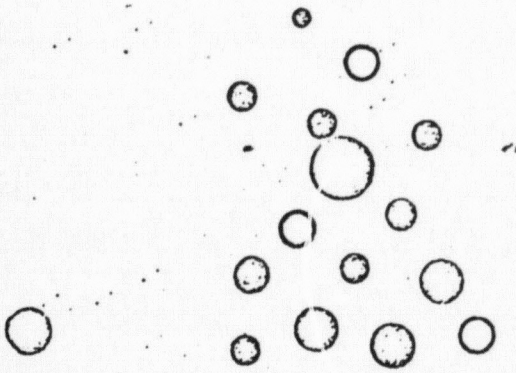
A 4371

CX-132-C

Operating principles,
care and maintenance of temperature compensated

Fluotec Mark II

vaporizers



CX-132-D

It has been said of the ubiquitous Fluotec vaporizer for Fluothane® that "it is the most economical Fluothane® Analyser available on the market today". Your Fluotec vaporizer is a precision vaporizer which deserves care and proper maintenance. Before leaving the factory each Fluotec is individually calibrated and checked with Fluothane®.

The Fluotec Mark II is a development of the original Fluotec and is an accurately calibrated vaporizer which makes it possible for the Anesthetist to add known concentrations of Fluothane® vapour to the fresh gases entering an anesthetic circuit.

When the Fluotec was first introduced Fluothane® was generally administered by open circuit using gas flows of 5-10 litres per minute. Gradually, lower flow rates were used, bringing in the semi-open circuit with fresh gas flows down to 2 litres per minute. This reduction in fresh gas flow has been continued by some Anesthetists who are now using Fluothane in completely closed circuits with the basal oxygen flow as low as 500-250 ml/min. (1)

The original Fluotec was calibrated for fresh gas flows down to 2 litres per min. (see Fig. 2) and below this the delivered concentration fell off quite quickly and so it was not suitable for completely closed circuit technique.

The first object in the development of the Fluotec Mark II was to remove this limitation and to make the vaporizer suitable also for use with completely closed circuits. On investigating the requirements of a Fluotec to deal with these low flows it was realized that different characteristics were necessary.

By reference to Fig. 2 it can be seen that the Fluotec Mark II was modified so that it produced a rising characteristic at flows below 4 litres per minute in order to provide it with characteristics which would give suitable concentrations for low flow techniques.

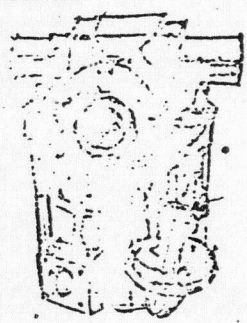
The Fluotec at low flows

It is well known that, in order to maintain the same depth of anesthesia, a higher percentage of Fluothane® must be administered when the fresh gas flow is reduced. This effect is particularly marked when the flow is reduced to 500 or 250 ml/min.

We can illustrate this matter in the following way. If a patient is being maintained in a level state of anesthesia with 6 litres of oxygen to which 3% Fluothane® is being added, we can say that the weight of Fluothane® which is being administered is "X" grammes per minute. If however, the flow rate of oxygen is reduced to 3 litres per minute, and the percentage of Fluothane® being added remains the same, then the weight of Fluothane® being administered is $\frac{\text{"X"}}{2}$ grammes per minute.

Accordingly, in the same interval of time (one minute) the weight or dosage of Fluothane® being administered to the patient has been reduced by one half.

Reference to Fig. 1 illustrates this point clearly. For example, at an 0.5 volumes percent dial setting and a 10 litre/min. flow the liquid consumption in ml. per hour of Fluothane® is 13.0 ml. If the flow is reduced by one half to 5 litres/min. the consumption of liquid Fluothane® is also reduced by half to 6.5 ml.



CX-132-F

Consumption of liquid Fluothane® at various vapour concentrations and different rates of flow

The columns shown below (Fig. 1) would be the consumption of liquid Fluothane® per hour at the temperature and pressures shown. Once experience has been gained with the drug and the techniques being used by the Anesthetist have been settled, the consumption figures shown could be used for budget purposes.

% Fluothane Vapour		0.5	1.0	1.5	2.0	2.5	3.0
GAS FLOW Litres/Min.	5	6.5	13.0	19.4	25.9	32.4	38.9
	10	13.0	25.9	38.9	51.9	64.8	77.8
	15	19.4	38.9	58.3	77.8	97.2	116.7

Fig. 1.

ml. of Fluothane® used per hour at 22°C (71.6°F) and 750 mm. Hg.

CONSTANTS USED FOR CALCULATION

Molecular Weight: 197.39

1 Mol. of gas occupies 24.53 litres at 22°C and 750 mm. Hg.

Specific Gravity of Liquid Fluothane® at 22°C equals 1.862.

A rise of 10 mm. Hg increases the consumption of Liquid Fluothane® by approximately 1.3%.

A rise of 10°C (18°F) decreases the consumption of Liquid Fluothane® by approximately 3.3%.

EX-132-G

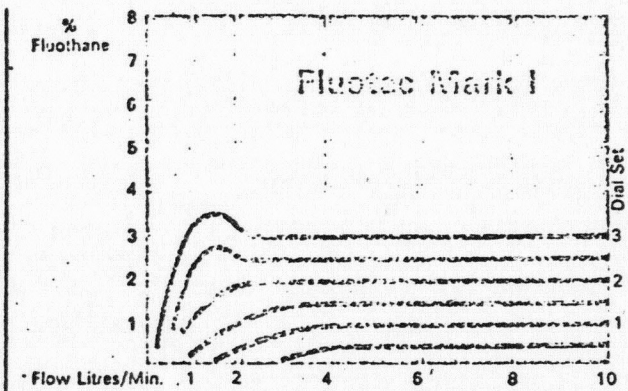


Fig. 1.

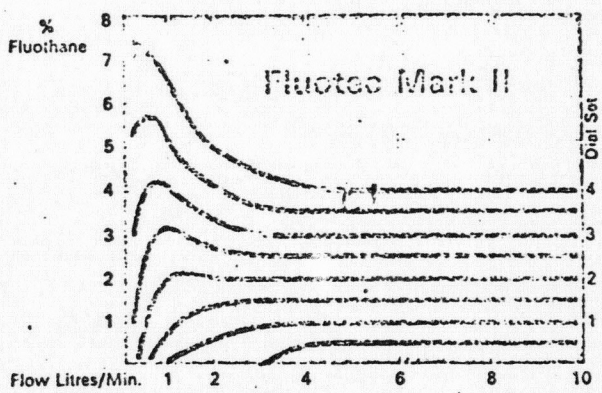


Fig. 2.

From the above data it can be stated that the lower the gas flow entering the circuit the higher must be the concentration to obtain an equivalent anesthetic stage and plane.

The Fluotec Mark II, therefore, can be used with equal satisfaction for open, semi-open, or even closed circuit techniques. (1)

From the foregoing it will also be realized that the concept of volumes percent alone is not a precise indication of dosage. The time element and the flow per minute must also be taken into account, as pointed out by John Snow in 1848.

A 4376

EX-132-H

(1)

Accuracy and stability of the Fluotec Mark II

In considering the accuracy of the Fluotec Mark II, a distinction must be carefully drawn between "linearity" and "accuracy".

Since the Anesthetist increases or decreases the dosage of the drug which he is administering according to the clinical signs of anesthesia exhibited by the patient, he should not in this sense use the percentages shown on the dial of the Fluotec as a guide to anesthetic depth and plane.

A vaporizer might have "linear" characteristics throughout its entire concentration range and not necessarily be accurate.

A vaporizer might not be "linear" throughout its entire range but still might be "accurate".

The characteristics of the Fluotec Mark II, as shown in Fig. 2, illustrates a deviation from linearity at flows below 4 litres per minute at the 4% dial setting, deliberately created for low flow techniques.

Each Fluotec Mark II has attached to it a duplicate of this chart. (Fig. 1)

It should be emphasized that by reference to the chart at the point of flow being used by the Anesthetist the concentration can be reliably read at flows below 2 litres per minute down to 250 ml.

These concentrations are reliable and accurate at the full temperature range between 60°F and 95°F.

The concentrations shown on the Fluotec Mark II chart are "reproduceable" at the indicated flows over the range of the above temperatures.

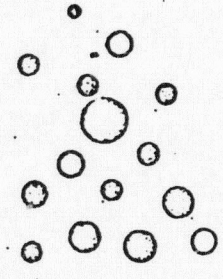
With respect to the stability of output in the Fluotec there has been nothing in our experience to indicate anything but extreme stability over long periods of time.

There is no mystery about a thermostat. By heat treatment our Company "cures" the bi-metalic strips used in the Fluotec. Because of the construction

CX-132-I

Fluotec features

of the bi-metalic strip, in which two metals with two different expansion coefficients are permanently bonded together, there is no way in which the thermostat might inadvertently "stick". It is similar in principle to the thermostat used in the conventional household unit to control the turning off and on of a furnace and it is surprising if one of these units fails over a period of many years. It is a characteristic of bi-metalic strips that the longer they last the longer they are likely to last.



The Fluotec Mark II is an accurately calibrated vaporizer by means of which known percentages of Fluothane® vapour can be added to the fresh gases of any standard continuous flow anesthetic apparatus.

As noted above, for low flow or closed circuit techniques the maximum range at 250 ml. is approximately 7.30%.

A safety feature of the Fluotec is that it will not deliver more than 4.0% as the flow rate is increased above approximately 3 litres.

The Fluotec Mark II will deliver any concentration of Fluothane® between 0.5 volumes percent and 4.0 volumes percent by rotating the calibrated control dial to the proper setting. For low flows and closed circuit techniques where metabolic oxygen only is flowing, it is possible to achieve the necessary higher concentration required in a reproduceable manner and the corrections for the dial settings are

CX-132-T

shown on the chart permanently attached to the vaporizer.

The following variable factors have all been taken into consideration to achieve these results:

1. Room temperature variation.
2. Cooling of the liquid by evaporation.
3. Duration of use.
4. Level of the liquid.
5. Variation in the total flow of fresh gas.
6. The effect of shaking.

These variable factors have been dealt with in the following ways:

1, 2, 3 & 4. A thermostat in the vaporizing chamber corrects for these variables within a range of 60°-90°F. By the addition of wicks the vaporizing chamber is designed so that the calibration is constant from full to almost empty, i.e. while there is still just a trace of liquid visible through the level window.

5. A new type of gas control ensures accurate and linear results when the total flow of fresh gas is between 4-15 litres/min. Below 4 litres/min. in the Mark I there is the "falling characteristic" shown in Fig. 2 and in the Mark II modification a "rising characteristic" for low flow techniques. In both vaporizers, the results below 4 litres/min. are reproduceable and consistent between 60°F and 95°F.
6. The series of wicks ensures complete saturation of the gas in the vaporizing chamber so the effect of shaking is eliminated.

Before leaving the factory each Fluotec is individually calibrated and checked over a wide range of gas flows and temperatures with Fluothane® used throughout in these tests.

MacKay and Kalow (2) noted that the Fluotec did not deliver a high initial concentration at a low dial setting, although this phenomenon was apparent in

A 4379

CX-132-K

Principle of operation

some other products. The prevention of a sudden surge of strong vapour due to a build up in pressure in the vaporizer has been brought about by incorporation of a "bleed-off" to atmosphere when the dial is in the "off" position.

Filling is made easy by incorporating a large filling funnel in the body of the vaporizer.

A "full line" on the window glass indicates the level of liquid in the vaporizing chamber, which cannot be overfilled.

Care must be taken if the Fluotec is being carried about with liquid in it that it be kept in an upright position so that Fluothane® will not splash up into the thermostat area. It should be emptied for transit or handled very carefully.

The container will accommodate 150 ccs. when filled completely and the large diameter window clearly shows the level of liquid. The vaporizer will function accurately so long as liquid can be seen.

The Fluotec is shown diagrammatically at Figs. 3 and 4.

Fig. 3 shows it in the "off" position.

Fig. 4 shows it in the open or any calibrated position.

Referring to Fig. 3 (off), metered gas enters at A and as shown by the arrows it meets the spindle F, goes through the by-pass valve G, along the port S to B and thence to the patient. None of the gas can enter or leave the vaporizing chamber N as ports C and D are closed by spindle F.

Rotation of the control M causes the spindle F to move to the right by virtue of the spiral groove R. (Note: In the actual vaporizer this groove R consists of a straight keyway type groove running into a spiral groove, but for this explanation we shall consider it as a simple spiral).

As the spindle F moves to the right the ports C and D are opened, and the opening of the by-pass port G is considerably reduced. This results in the "open" position.

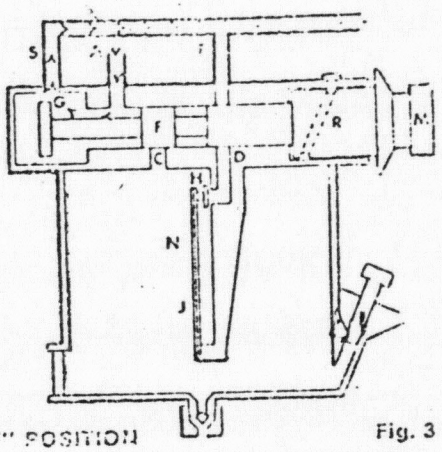
CX-132-L

In the "open" position (Fig. 4) rotation of the control dial M adjusts the opening of the port G, which splits the gas flow between the vaporizing chamber N and the diluting gas passing along S, thus altering the percentage of the mixed gases.

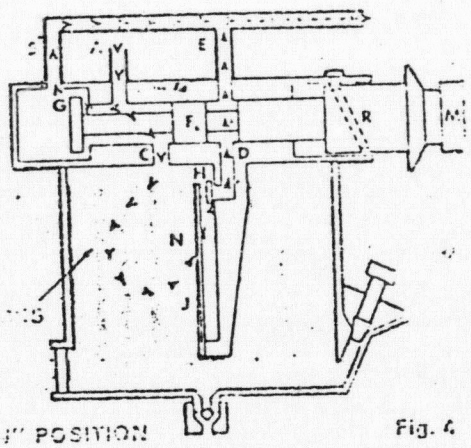
The amount of Fluothane® picked up in the vaporizing stream will vary with the temperature of the Fluothane®. The Fluothane® temperature will vary either due to variation of room temperatures or to the cooling which takes place when Fluothane® is vaporized.

To compensate for this, the valve H is controlled by a bi-metalic strip J, and opens automatically when the temperature falls, and closes when the temperature rises. At a given dial setting, therefore, the mixed percentage issuing at B is independent of room temperature or previous use of the Fluotec.

Because of the design of the filling funnel it is impossible to over-fill the Fluotec which can be a hazard in vaporizers in which this feature is not incoporated.



"OFF" POSITION Fig. 3



"ON" POSITION Fig. 4

CX-132-M

Preparation for use

Before charging with Fluothane® always make sure that the drain is completely closed. To charge, put the control dial into the "off" position and remove the stopper. Fluothane® can be poured directly into the filler funnel from the bottle. A full charge is 150 ccs.

Additional liquid can be added at any time but first return the calibrated control dial to the "off" position before removing the filler plug. After topping up replace the stopper before re-setting the dial.

When the control dial is at "off" it is necessary to pull it out as far as it will go before rotating it to the calibrated setting required. On returning to the "off" position the dial will retract inwards.

The use of other volatile agents in the Fluotec

It has frequently been asked what the output from the Fluotec would be if other agents were used in it, a natural outgrowth of the quantitative concept.

Our Company believes strongly that all vaporizers for volatile agents should be clearly labelled for one agent only.

There are a number of potent volatile agents commonly used in Operating Rooms to-day.

Once an agent has been placed in a vaporizer the identity of that agent is lost. For "so called versatility" many Anesthetists take the stand that they wish to be able to use any volatile agent in any given vaporizer. We fail to see the logic in this position because the same Anesthetists accept or insist on pin-indexing; the diameter index safety system for thread coding gases; non-interchangeable quick disconnects, all to protect the patient and themselves against the inadvertent administration of

EX-132-V

the wrong gaseous agent. The inconsistency is apparent.

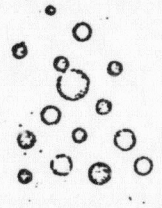
There are a number of cases in the literature where disastrous results have occurred because the identity of a volatile agent is lost once it is placed in a vaporizer. Unsuspecting Anesthetists have learned to their sorrow that a vaporizer labelled for one agent actually contained another agent, placed there by the previous user. Reprints are available where this unfortunate event has occurred. (3) (4)

If by any chance an agent other than Fluothane® has been inadvertently put into a Fluotec the following instructions will enable the user to safely remove it from the wicks:

Instructions for removing agents other than Fluothane® from a Fluotec:

The Fluotec has a series of wicks, as noted in the preceding diagrams (Fig. 3). Because of this even though the vaporizer is drained, the Fluothane® might be contaminated by the previous agent still contained in the wicks. The wicks must, therefore, be dried to remove this absorbed liquid. Proceed as follows:

a. Leave the drain plug open and remove the filler plug.
b. Block the outlet of the vaporizer with a cork.
c. Turn the dial to maximum setting.
d. Pass 5 litres/min. of air, or O_2 and N_2O, or O_2 into the Fluotec inlet.
e. Wait until the smell of the Anesthetic last used disappears.



A 4383

CX-132-0

The Fluotec Mark II with assisted or controlled respiration

Several investigators have drawn attention to the effect of assisted or controlled respiration on the output of vaporizers which are outside the breathing circuit (5).

With respect to this phenomenon when using the Fluotec Mark II, the effect has been most pronounced at low concentration dial settings and low flows. Hill & Lowe pointed out (5) that when the pressure at the outlet of the Fluotec was raised to 57 cm. H_2O the pressure generated by a ventilator did not affect the pressure at the outlet of the Fluotec.

Since many Anesthesia Machines are so constructed that it is not advisable to subject them in every day use to pressures as high as 57 cm. H_2O on account of the production of leaks, Cyprane Limited have designed a Pressurizing Valve for fitting to the outlet of the Fluotec vaporizer, which holds the pressure at a figure somewhat below 57 cm. H_2O. (6).

While this valve does not hold the pressure within the Fluotec entirely steady, it does allow gas to continue to flow through the vaporizer throughout each respiratory cycle of the ventilator.

This produces a much smoother control of the output at low flows and low dial settings. It has been favourably commented upon as preventing inaccuracies caused by the "pumping effect" of respirators during assisted or controlled respiration.(7) If the Fluotec is equipped with this special valve at low flows and low concentrations with assisted or controlled respiration the dial settings closely approximate the output from the vaporizer.

EX-1330-2

Service problems in the field

There is potential danger for the patient if the Fluotec is dropped on the floor upside down. In this position Fluothane® can escape through the ports into the spindle area and cause very high concentrations to be temporarily administered.

In addition, dropping the Fluotec may damage the spindle even though the damage is concealed, and cause variations from the indicated concentrations.

If the vaporizer is dropped upside down the Fluothane® must be allowed to dry from the area of the spindle, and this might take several hours. The vaporizer is definitely not to be used until the Anesthetist is confident that the liquid has dried out from the spindle area.

The second problem of the "sticky dial" is believed to be brought about by an accumulation of thymol on the spindle over a period of time.

The tolerance between the spindle and the body of the vaporizer, as can be noted on Figs. 3 and 4 showing the cross section of the Fluotec Mark II, is of such a fine nature that it almost gas-tight. If thymol accumulates in this area, and the very fine coating of lubricant has been removed, the turning of the dial becomes difficult.

To help alleviate and correct this situation there are three courses which are advisable:

1. We recommend that the Fluotec be drained once a week, say on the day before the weekend after allowing the vaporizer to almost empty itself. If there is an accumulation of thymol it will appear in the residue which we suggest be drained into a clean beaker. If this is discoloured with the characteristic yellow or brownish colour of thymol we suggest it be discarded instead of being returned to the Fluothane® bottle.

   We think this procedure should reduce the incidence of sticky dials.
2. Should the dial become sticky or tacky a Cleaning

A4385

EX-132-Q

Kit is available at the nominal cost of $15.00, complete with instructions, tools and spare parts.

Any Fluotec with an "A" before or after the serial number can be dismantled in the field, the spindle and bore cleaned out, reassembled and put back to use without any danger of upsetting the calibration.

If your Hospital has a service man of ordinary intelligence on the staff he can do this job in between ten and fifteen minutes.

Should there still be one of the earlier Fluotecs in your possession which has never been modified, as indicated by the lack of letter "A" before or after the serial number, this vaporizer should be returned to our Laboratory in Lancaster for a clean-out and the necessary modification to convert it to an "A" type vaporizer. We routinely check the calibration during this procedure and the modification to "A" type is done free of charge.

We unconditionally guarantee the Fluotec against defective workmanship or material (not damage) for a period of twelve months from date of purchase.

It is our recommendation that the Fluotec, like any other fine piece of Hospital equipment, be serviced regularly.

3. At the end of the first twelve months, or if preferred at the end of the first eighteen months, we recommend that the Fluotec vaporizer be serviced at the Laboratory.

Good maintenance safeguards accurate performance and trouble-free operation.

The accumulation of thymol in the wicks is attended to by a thorough cleaning of the sump and the introduction of new wicks into the vaporizer.

CX-122-R

The body and spindle of the vaporizer are completely dismantled, thoroughly cleaned and re-lubricated.

The inlet and outlet orifices and the thermostat are carefully examined and cleaned if necessary.

The vaporizer is then checked on the Refractometer at all major settings, including a high flow and low flow test at temperatures of 85°F and 95°F.

The test is made with Fluothane® and a total of twenty-six calibration checks are made.

The cost of this service is $45.00 and a Service Contract whereby Fraser Sweatman Inc. will maintain records and advise the Hospital when servicing is due is available.

We also have available a chart which can be placed in a convenient area in the Operating Room or Department of Anesthesia where the Hospital can maintain its own service records for the Fluotecs in their possession.

The Contract includes prior authority for the service check at $45.00, and if there has been damage, concealed or otherwise, to the vaporizer concerned, necessitating the replacement of parts, an estimate will be sent to the Hospital for authorization before work is commenced.

The time required for the service, other than the cases where authority is required, is less than three weeks.

In conclusion, we believe that with proper weekly drainage of the vaporizer; the inclusion of a Cleaning Kit if a service man is available for on-the-spot release of a sticking dial; and a regular annual service check, it should reduce the incidence of sticky dials materially and ensure the Anesthetist of a proper functioning instrument. The Fluotec will give many years of satisfactory and accurate service under these conditions.

CX-132-5

Some misconceptions

The sticky dial problem seems to have created some palliative measures which do more harm than good.

One of these is the injection by a syringe of Fluothane® or Ether into the very fine gap between the concentration dial to free the stuck spindle.

It is true that this procedure will temporarily free a stuck spindle but the result is only temporary. Both Fluothane® and Ether are excellent lubricant solvents and if there is any lubricant left on the spindle this procedure makes sure that it is removed.

The thing to do is to clean the bore and the spindle and re-lubricate it.

We receive at our Laboratory in Lancaster a number of Fluotecs in which the wicks are soaked with water. We have never been able to ascertain with certainty how this water gets into the sump. It is obviously far more than one would expect due to normal condensation and this would not accumulate if the vaporizer was drained regularly in any event.

We have been advised by certain Hospitals that when they have a sticky dial, they will place the vaporizer either in hot water, or invert it and place the body in hot water. This will undoubtedly temporarily release a sticky dial but the results are dangerous. When water gets into the sump and wicks in any quantity it interferes immediately with the vaporizing efficiency of the vaporizer.

More dangerous is the effect of a mixture of water and Fluothane® on the metals employed in the bimetalic strip, which are inert in Fluothane® alone but react by forming a white lime-like coating when Fluothane® and water encounter it. This can cause malfunctioning. This practice of using hot water to free a dial should be discouraged completely.

CX-132-T

Brackets for mounting Fluotec vaporizers**

HEIDBRINK® CABINET MODELS—OLD AND NEW

47604	1		Fluotec
150303	1	FS-2A	Inlet tubing adapter
150304	1	FS-2	Outlet tubing adapter
150306	1	FS-4	Bag adapter straight
150309	1	FS-21	Universal head
640246-65	1	FS-22	Vacuum base
350815	*1	FS-23	Vaporizer clamp

*For permanent attachment.

OLD STYLE HEIDBRINK® STAND AND CART MODELS

47604	1		Fluotec
150803	1	FS—2A	Inlet tubing adapter
150804	1	FS—2	Outlet tubing adapter
150807	1	FS—4C	Bag adapter curved
150309	1	FS—21	Universal head
350814	1	FS—20	Side arm bracket
150802	1	FS—1	Directional valve
150301	1	A—15	Threaded tubing adapter
150805	1	FS—3	T.I.B. Breathing tube adapter

NEW STYLE HEIDBRINK STAND AND CART MODELS WITH VERNITROL®

47604	1		Fluotec
150803	1	FS—2A	Inlet tubing adapter
150804	1	FS—2	Outlet tubing adapter
150809	1	FS—21	Universal head
150808	1	FS—6	Vaporizer mount for Ohio 3333
150807	1	FS—4C	Bag adapter curved

FOREGGER® CABINET MODELS—GREIFENSTEIN BRACKET

47604	1		Fluotec
150303	1	FS—2A	Inlet tubing adapter
150804	1	FS-2	Outlet tubing adapter

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EX-132-C

150809	1	FS—21	Universal head
250812	1	FSG—8-9	Greifenstein bracket with vaporizer mount
150806	1	FS-4	Bag adapter straight
150807	1	FS—4C	Bag adapter curved

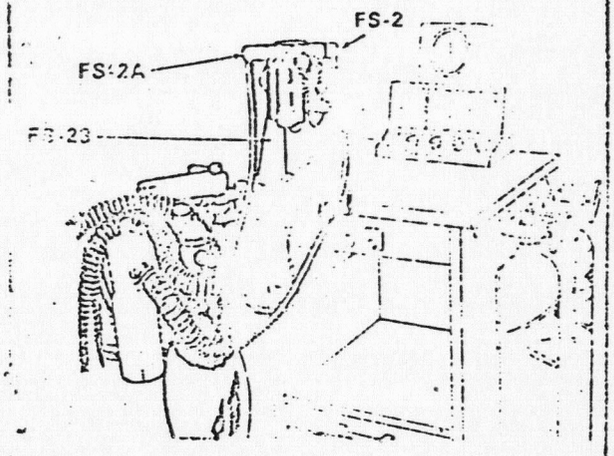
FOREGGER® CABINET MODELS—
VACUUM BASE OR PERMANENT CLAMP

47604	1		Fluotec
150803	1	FS—2A	Inlet tubing adapter
150804	1	FS—2	Outlet tubing adapter
150809	1	FS—21	Universal head
640246-05	1	FS—22	Vacuum base
350815	*1	FS—23	Vaporizer clamp
150806	1	FS—4	Bag adapter straight

*For permanent attachment.

**Illustrated brochure and prices on request.

150804 FS-2 Outlet Tubing Adapter
150803 FS-2A Inlet Tubing Adapter
350815 FS-23 Vaporizer Clamp



Permanent Clamp as suggested replacement for Vacuum Base

As mentioned on page 14, the habit of carrying the Fluotec from one Operating Theatre to another and attaching it by means of the Vacuum Base to any convenient table top has brought about damage to the Fluotec by dropping the vaporizer.

CX-132-V

Since the wide-spread acceptance of Fluothane® is now an accomplished fact it would appear that the permanent attachment of the Fluotec to the table top of any Anesthesia Machine which is to be used in conjunction with the drug is now desirable. Accordingly, a permanent bracket, the 350815 65 FS-23 Vaporizer Clamp, is offered as an alternative to the 640246-65 FS-22 Universal Vacuum Base.

REFERENCES

(1) Robson, G., Gillies, D. M., Cullen, W. G., Griffith, H. R. Fluothane (Halothane) in Closed Circuit Anaesthesia. Anesthesiology, Vo. 20, No. 3, May-June, 1959.

(2) Mackay, I. M., Kalow, W. A Clinical and Laboratory Evaluation of Four Fluothane Vaporizers. Can. Anaes. Soc. J., Vo. 5, pp. 248-261, 1958.

(3) Case Number 39—Accidental Use of Trichloroethylene (Trilene, Trimar) in a Closed System. Anesthesia and Analgesia—Current Researches, Vo. 43, No. 6, Nov.-Dec., 1964.

(4) Prepared by the Anesthesia Study Committee of the New York State Society of Anesthesiologists. Mark, Lester C., Marx, Gertie F., Erlanger, Herbert., Joffe, Sarah., Kepes, Edith R., Ravin, Mark B. Improper Filling of Kettle-Type Vaporizers. New York State Journal of Medicine, May 1, 1965, pages 1151, 1152.

(5) Hill, Dennis W., Lowe, Harry J. Comparison of Concentration of Halothane in Closed and Semiclosed Circuits During Controlled Ventilation. Anesthesiology, Vo. 23, No. 3, May-June, 1962. Lowe, Harry J., Beckham, Lloyd M., Han, [illegible] H., Evers, John L. Vaporizer Performance Closed Circuit Fluothane Anesthesia. Anesthesia and Analgesia, vo. 41, No. 6, Nov.-Dec., 1962.

(6) Edmondson, W., Hill, D. W. A Pressurizing Valve for the Fluotec Vaporizer. British Journal of Anaesthesia, Vo. XXXIV, No. 10, Oct., 1962.

(7) Kapfhammer, Von V., Atabas, A. Der Fluotec Mark II mit angebautem Druckausgleichventil. Der Anaesthesist, Band 14, Heft 9, Sept., 1965.

A 4391

CX-132-W

"The question may be asked, whether the medical man can always determine in what degree of etherization the patient is, and by that means estimate correctly whether or not he is liable to pain. I am not sure that he always can, by the mere observation of the patient. I have never been deceived as to the degree of etherization, but then *I always know the strength of the vapour which the patient is breathing, and by observing the length of time that he has been inhaling, and the depth of his inspirations, I know in what stage he ought to be*, and am in this way guided in the cases in which well-marked symptoms are absent."

—Inhalation of the Vapour of Ether
John Snow

Fluotec Mark II

Fraser Sweatman Incorporated

5490 Broadway, Lancaster, N.Y. 14086 Area 716-684-0564

ASSOCIATED COMPANIES

Fraser Sweatman (Canada) Ltd.
36 Malley Road, Scarborough 705, Ontario, Canada, Area 416-752-1790

Cyprane Limited
West Lane, Keighley Yorkshire, England

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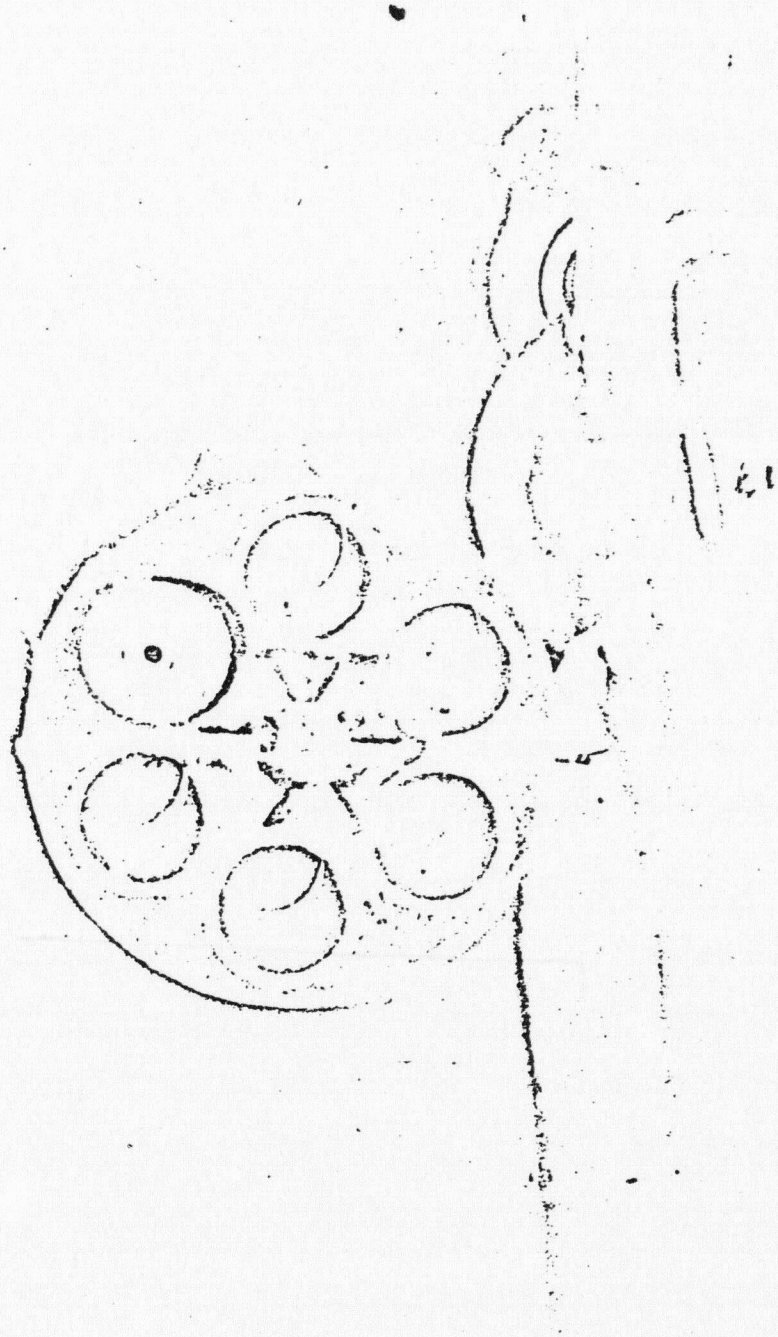
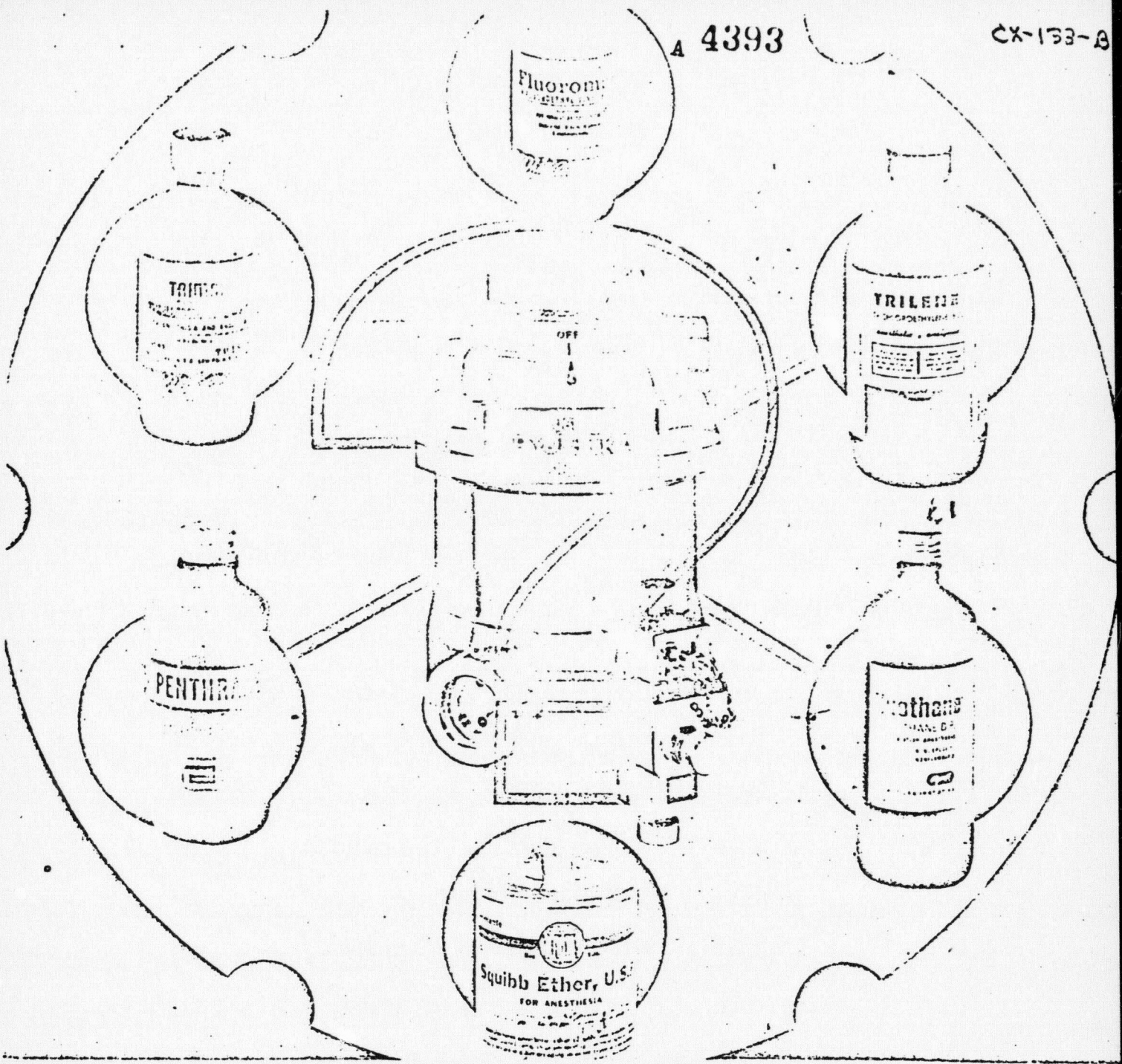
CX-133-A





...ered Trademarks Penthrane®, (Abbott Laboratories); Trimar®, Fluoromar®, (Ohio Medical Products); Fluothane®, Trilene®, (Imperial Chemicals Industries Ltd.; Averst Laboratories); Squibb Ether, (E. R. Squibb and Sons Ltd.

Case No. 39: (1)

Accidental use of Trichloroethylene in a Closed System:

"... the following questions come to mind:

(3) Are we in an untenable position when organized anesthesia rigidly enforces a uniform international color code for the identification of tanks containing compressed gases which must be used in conjunction with noninterchangeable pin-indexing systems, while at the same time a variety of vaporizers may be filled with powerful liquid anesthetic agents WHOSE IDENTITY IS LOST as soon as they are poured from the manufacturer's can or bottle?

(4) Are all anesthesiologists constantly vigilant in demanding of themselves, their associates, residents, and nurses that absolutely no unlabeled drugs shall be administered intravenously, intramuscularly, rectally, topically, or by inhalation methods?

(5) Finally, does the possibility for such an anesthetic misadventure exist in my practice?" (1)

(1) Nicholson, M. J., Accidental use of Trichloroethylene and Closed System, ...

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CX-133-C

WHOSE IDENTITY IS LOST?

Case No. 39 reported in Anesthesia and Analgesia—Current Researches, in 1964 (1) discussed a serious problem and stated as its cause "It was subsequently discovered that due to an error Trichloroethylene, instead of Fluothane®, had been placed in the Copper Kettle®."

In "Time" Magazine the week of December 10 in 1965 it was reported to the public that a vaporizer was found to contain Ether when the Anesthesiologist wished to use another agent, and the vaporizer was drained of the Ether into an empty bottle labelled for an induction agent. (3) The rubber cap was put back on the bottle, and three patients suffered unalterable consequences when Ether was injected intravenously.

The first of these errors was due to filling and not identifying the drug by labelling the vaporizer.

The second error was draining a vaporizer into a bottle labelled for an induction agent and not identifying the drug by re-labelling the container or discarding it.

In both cases the identity of the drug was irrevocably lost when removed from its container.

The question must be asked—"(5) Finally, does the possibility for such an anesthetic misadventure exist in my practice?" (1)

As an illustration of the lethal potentialities Fluothane® has been placed into the Pentec Mk. I and the Pentec Mk. II and the concentrations are shown in Fig. 1. Lethal concentrations could occur if a Pentec Mk. I or Pentec Mk. II were "topped up" accidentally with Fluothane® (2).

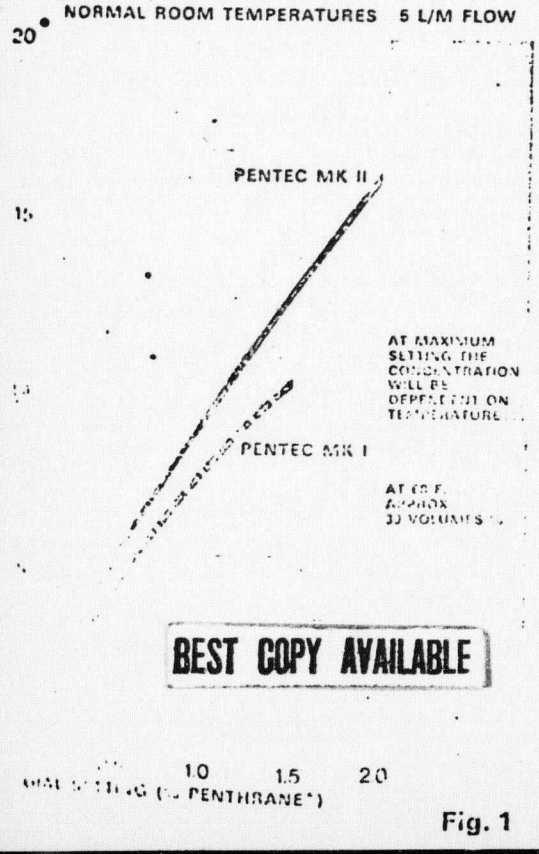

Fig. 1

For many years, diethyl-ether was the major volatile agent. Because of the manner in which it was used, with in-circuit draw-over vaporizers, its lethal (55 volumes %) initial concentration at room temperature was reduced exceedingly quickly due to the rapid loss of heat and consequent reduction in concentration delivered.

The closed system being used was self-regulating without the use of assisted or controlled respiration and the drop in vaporizer efficiency due to cooling produced a concentration which was low enough, under this self-regulating breathing system, to coincide with third plane third stage anesthesia. This agent, therefore, became known as a very "safe" agent.

However, the design and introduction of a more sophisticated and efficient vaporizer, primarily conceived by Lucien Morris, M.D. (4), introduced into anesthesia a piece of equipment which, if not properly understood, made Ether a drug with lethal implications totally different from those experienced clinically with less efficient in-circuit vaporizers.

Since the introduction of Fluothane® about ten years ago, the specially designed and calibrated vaporizer such as the Fluotec for the administration of this new drug, of even more awesome potency, brought about a major change in anesthesia by the manipulation of a SINGLE dial.

To meet the requirements of modern anesthesia it has become almost mandatory that an individual vaporizer, specially calibrated and labelled for the agent concerned, should be used in the "out-of circuit" position on the apparatus so that known quantities of the drug are delivered to the breathing system.

Indeed, because of the awesome potency of these newer drugs their use would have been severely restricted had not precision vaporizers such as the Fluotec become available.

There are several volatile agents which have come to market in the past ten years and more are being tested at the present time.

We offer the opinion to-day that, because of these new conditions, only one drug should be used in a vaporizer clearly marked and calibrated for its use.

The FS Pin Safety System has been designed to ensure the identity of the drug from bottle to vaporizer and back to the bottle (if it is retained), to protect the Anesthesiologist, the hospital and the patient from the accidental hazards implicit in the loss of identity of a drug.

BEST COPY AVAILABLE

(2) Personal communication Benton King, M.D. Buffalo, N.Y.
(3) "Time" Magazine, "The Lethal Ether" vol. 86, #24, page 73, December 10, 1965.
(4) Morris, L. E. New Vaporizer for Liquid Anesthetic Agents. Anesthesiology 13:567 (Nov.) 1952.

A 4395

EX-133-D

THE PIN SAFETY SYSTEM FOR VOLATILE AGENTS

In 1967, Cyprane Limited and Fraser Sweatman Inc. announced the introduction of a system to prevent the loss of identity of drugs.

Almost immediately afterward, another of our Design Engineers designed an even more flexible system, permitting the indexing of twelve drugs on a single key-way of approximately 7/16" x ½", and incorporating fewer parts and, therefore, fewer possibilities of breakdown.

The purpose of this booklet is to introduce the new system, which has obsoleted the first system announced before marketing.

Principle of Operation

The FS Pin Safety System is a device for ensuring that the vaporizer is filled only with the drug for which the vaporizer was originally calibrated. With the system the vaporizer can be filled quickly without spilling any drug and the danger of overfilling is avoided.

The system consists of two parts: The combined filler and drain unit attached to the vaporizer (as shown in Fig. 2 and Fig. 3), and the bottle unit (as shown in Fig. 4).

The bottle adapter consists of a cap which will fit only the drug bottle. Attached to this cap are two flexible tubes. On the delivery end of these two tubes is attached a plug which fits into a socket in the filler-drain unit. This filler socket is normally sealed by a blank plug P. By a special pin identification system the plug attached to the drug bottle can only be fitted into the filler or drain sockets on the correct vaporizer.

When a Cyprane vaporizer is filled the blank plug P is removed after loosening the retaining screw O. The plug on the bottle unit is inserted in place of the blank plug. With the holes down the retaining screw is tightened and the bottle is raised to a level higher than the level of the filler. Liquid flows down the outer tube A and enters the vaporizer at Q. The displaced air passes out of the vaporizer at R and up the inner tube B. When the liquid level has risen to the level of the air outlet hole R, which corresponds to the FULL mark on the filler window, the flow will automatically stop because no more air can be displaced.

For draining purposes the plug on the bottle adapter is fitted into the drain with the holes in the plug uppermost and the retaining screw is tightened. The drain tap T is opened (counter-clockwise) and liquid drug flows out of the vaporizer and down the outer tube A. The displaced air in the drug bottle passes up the inner tube B and is vented to atmosphere via duct U.

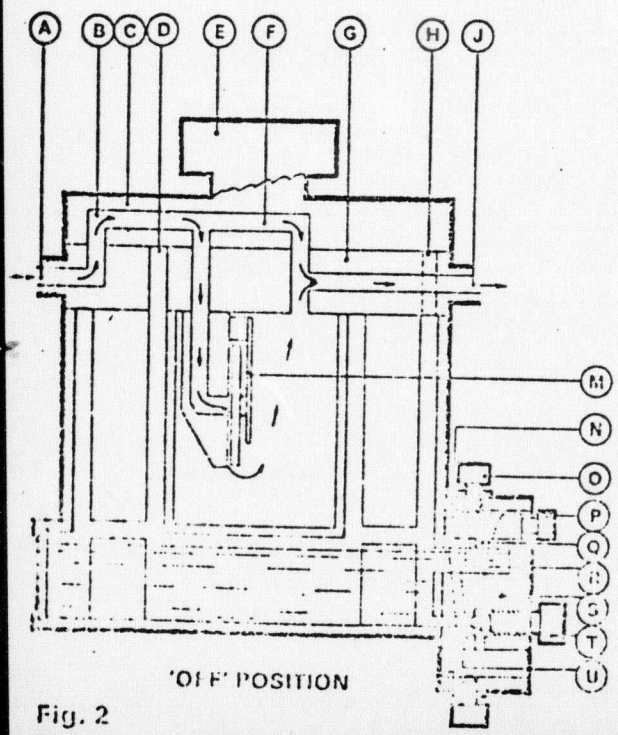

Fig. 2

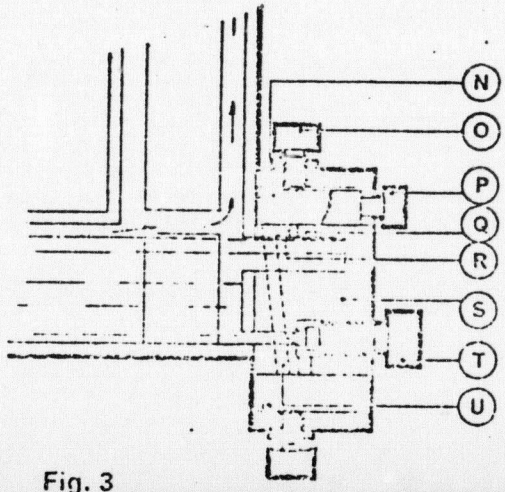

Fig. 3

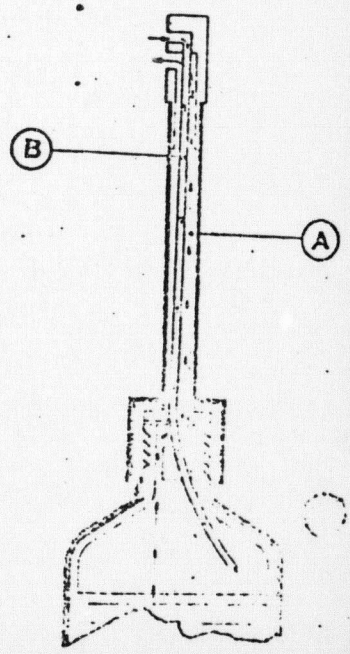

Fig. 4

Filling the Vaporizer

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FOR SAFETY

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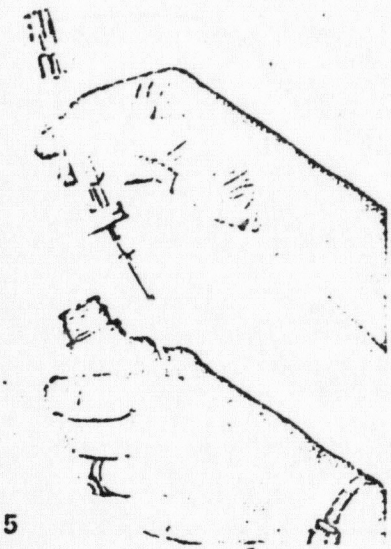

Fig. 5

Remove the top seal from the anesthetic bottle and screw the FS Pin Safety Filler Drain unit to the bottle.

Fig. 6

With the FS Pin Safety Adapter attached to the bottle the bottle is ready for filling the vaporizer.

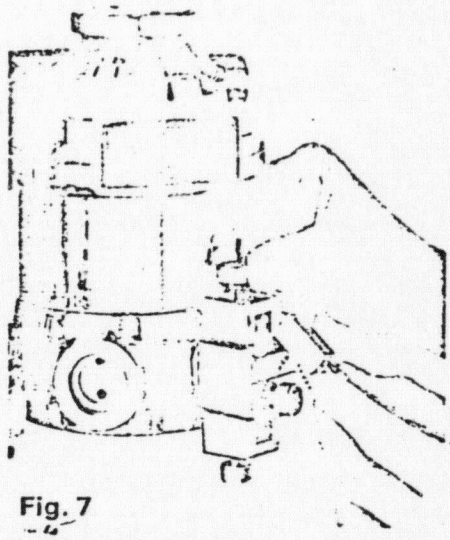

Fig. 7

The filler plug is removed by turning the retaining screw at the top counter clockwise and pulling out the filler plug.

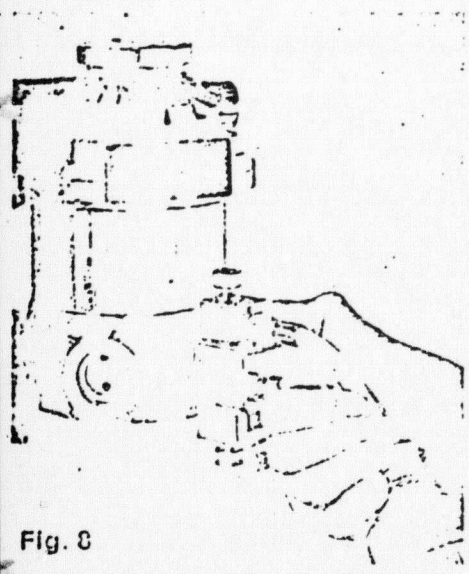

Fig. 8

The drug bottle, equipped with the Pin Safety dispenser, is grasped in the right hand by the plastic tubing with the thumb on the top of the adapter at the key-way so that the two holes are downward for filling. This is fitted in to the filler socket normally sealed by the blank filler plug. By a special Pin Identification System only the correct Pin Safety dispenser will fit into this matching filler socket. Care must be taken to bend the tube slightly so that the bottle is at a lower level than the inlet on the vaporizer so that the drug does not spill out of the tube. After insertion the retaining screw is turned clockwise and tightened to seal the filler tube in its receptacle.

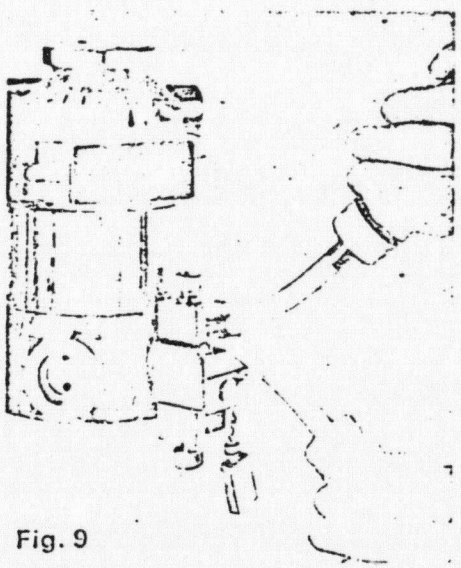

Fig. 9

The bottle is then raised above the level of the filler socket but not to such an extent that it forces the tube to kink. If it is moved gently up and down air bubbles will clear rapidly and filling takes place quickly and without spilling.

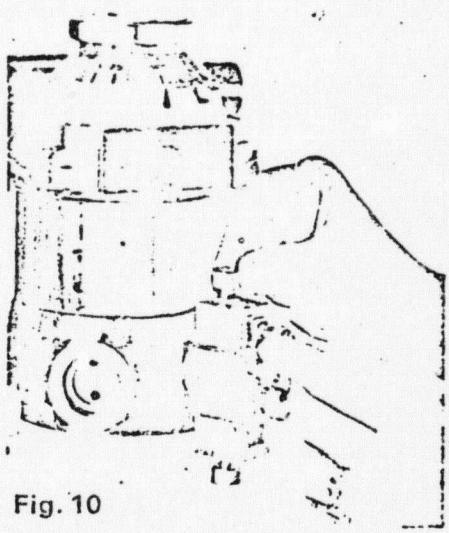

Fig. 10

To prepare the vaporizer for use the bottle adapter is removed, the blank filler plug is inserted and tightened with the retaining screw and the vaporizer is ready for use. Be sure to replace filler plug and tighten retaining screw or gas will escape through filler.

Draining the Vaporizer

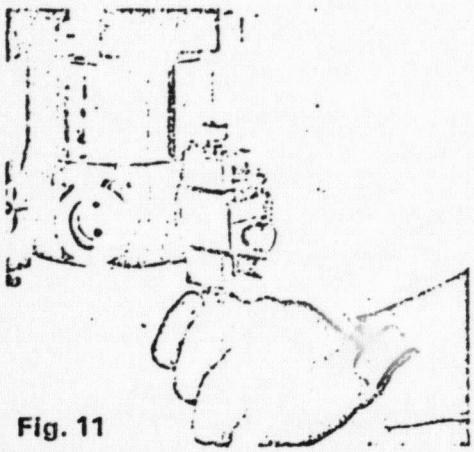

Fig. 11

The bottle is inserted similarly to filling except that the holes in the bottle adapter are up and the bottom socket is used.
The retaining screw is tightened.

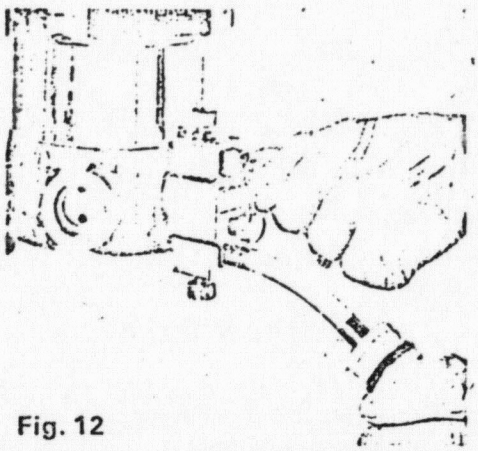

Fig. 12

In order to let air vent from the bottle it is necessary to remove the filler plug when draining. The bottle should be held slightly downward without kinking the tube.

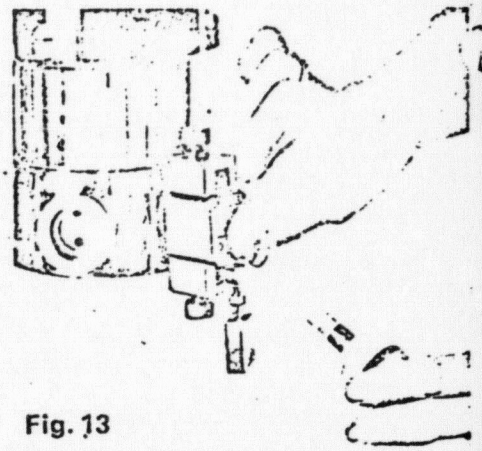

Fig. 13

The drain valve on the front is then opened counter clockwise and the vaporizer will drain.

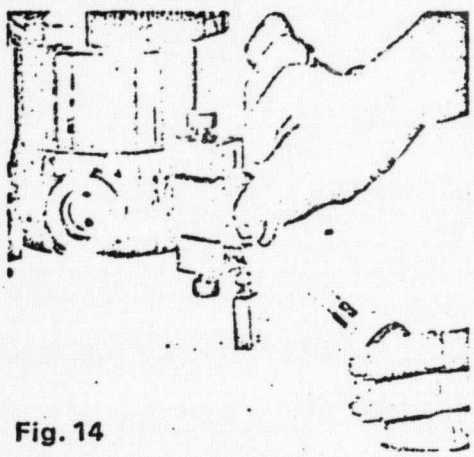

Fig. 14

At the completion of draining the drain valve is closed by rotating clockwise.

It should be noted that it is good practice to drain the vaporizer of its residual drug when it is low into an empty bottle and this small amount of drug should be discarded. It will contain most of the oxidized impurities and since most drugs have stabilizing compounds in small amounts, which tend to crystalize out in the wicks of the vaporizer, drug purity can be maintained best by putting fresh drug into the vaporizer and discarding used drug residues with accumulated contaminants.

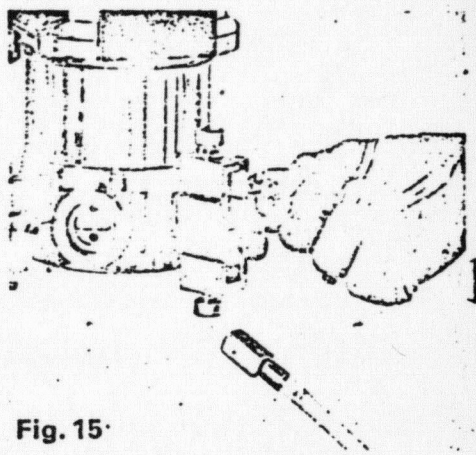

Fig. 15

The bottle is removed and the filler plug is replaced and tightened by its retaining screw.

All of the existing Cyprane Tec-type vaporizers can be converted to Pin Safety System by the purchase of a new sump containing the Pin Safety Filler and Drain Unit and an Adapter for the appropriate drug.

This conversion can be performed in our laboratory facilities and at the same time it is recommended that the vaporizer be given a regular service check. The cost of conversion is $125.00 for the sump and adapter and $45.00 for the service check.

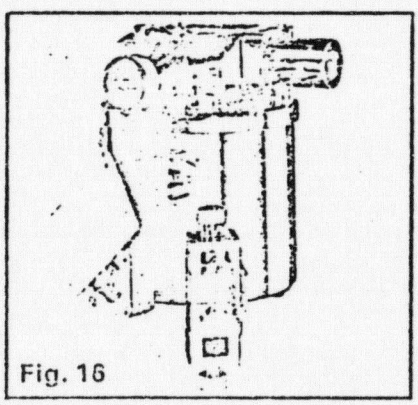

Fig. 16

SERVICE POLICY

All Cyprane Vaporizers are unconditionally guaranteed against faulty workmanship or material for a period of twelve months from date of purchase.

We recommend that every vaporizer be serviced in each year following the expiration of the guarantee period.

Experience has demonstrated that residual contamination from continued use of vaporizers should be removed to ensure maximum purity of the drug. An Annual Service Contract is available at $45.00 per annum and Fraser Sweatman Inc. will be pleased to advise the hospital of the dates when servicing is due.

ASSOCIATED COMPANIES

Fraser Sweatman Incorporated
TOWNSHIP LINE ROAD, HATFIELD, PA. 19440 AREA 215-723-6525
Fraser Sweatman (Canada) Limited,
77 GRENVILLE STREET, TORONTO 5, ONTARIO AREA 416-925 4448
Cyprane Limited, KEIGHLEY, ENGLAND.
Fraser Sweatman Incorporated, Service and Repair Facility,
2 [illegible] AVENUE, BUFFALO, NEW YORK, 14213 AREA 716-[illegible]

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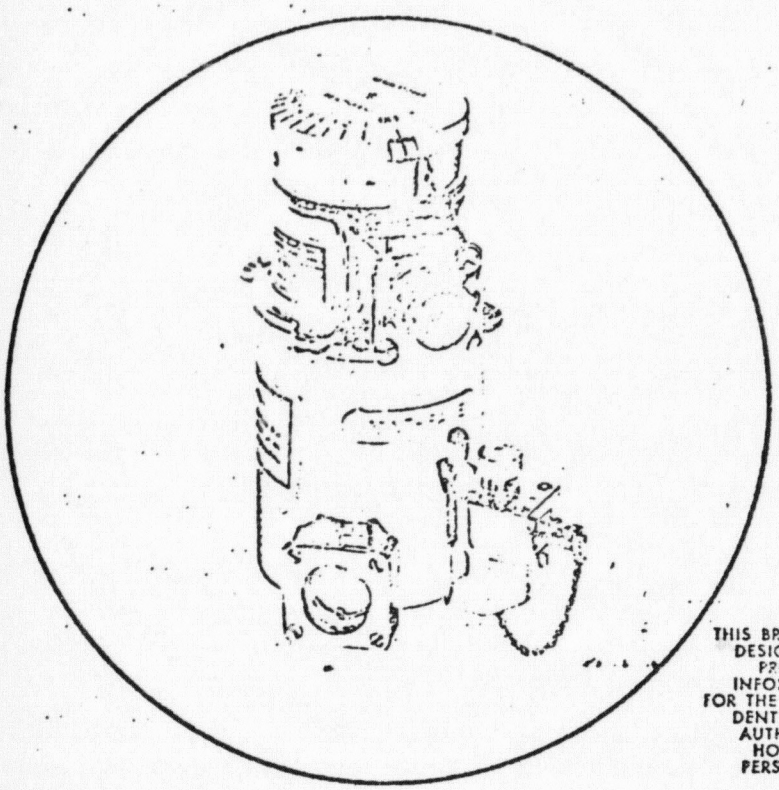
FRASER SWEATMAN INCORPORATED

Products For Anesthesia

FS–713

EX-135-A

AE VAPORIZER



THIS BROCHURE IS DESIGNED TO PROVIDE INFORMATION FOR THE PHYSICIAN, DENTIST, AND AUTHORIZED HOSPITAL PERSONNEL.

The AE (Draw-Over) VAPORIZER is flow and temperature compensated. It is a "Low Resistance" type vaporizer allowing accurate calibrated vaporization at flow rates determined by the patient, or by the volume of gas drawn through in controlled respirations.

[1]

MacKay, Iain M., A Compact Anaesthetic Apparatus For Emergency Use, Can. Anaes. Soc. J., Vol. 12, No. 3, May, 1965, pp. 298-305.

Coursey, J. W.; Wilson, R. D., A New Draw-Over Halothane Vaporizer, Anesthesia and Analgesia, Vol. 44, No. 1, pp. 147-157.

The AE Vaporizer can be adapted to demand flow anesthesia machines in current use. The Male Threaded Outlet Connection of the Quantiflex RA and the McKesson Norgraf will accommodate the AE Vaporizer without any added adapters. A single adapter is required for the Narmatic Models. The Vaporizer is equipped with the FS Pin Safety System for the utmost in safety and ease of filling. The vaporizer cannot be overfilled. A liquid level sight glass is provided for visual contents check. A single control dial adjusts the delivered concentration.

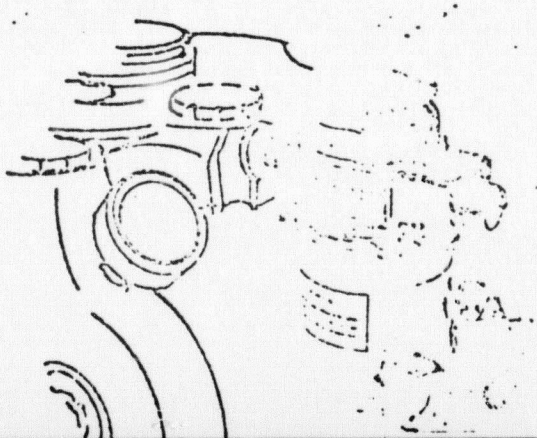
300023 AE Vaporizer, Fluothane®
calibrated 0.5% to 5.0% w/Pin Safety

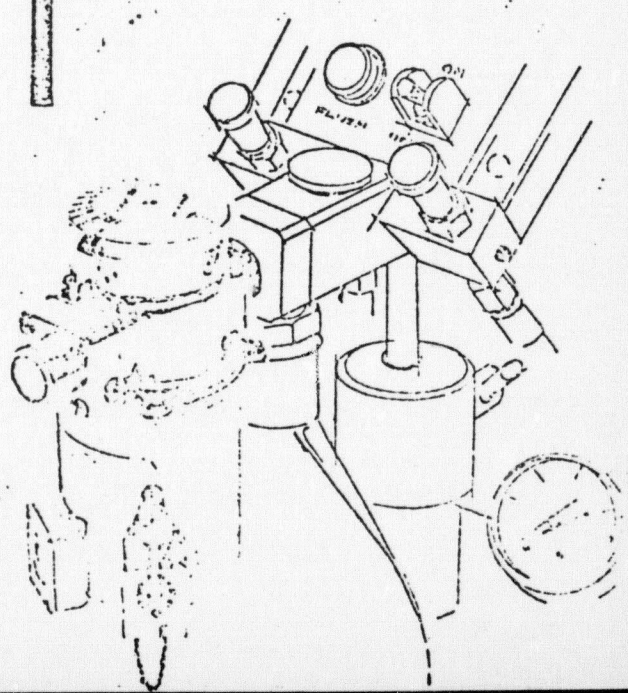
300025 AE Vaporizer, Penthrane®
calibrated 0.1% to 1.0% w/Pin Safety

317024 Adapter for McKesson Narmatic

Fraser Sweatman Incorporated
5490 Broadway, Lancaster, N.Y 14086, Area 716-684-0564

ASSOCIATED COMPANIES
FRASER SWEATMAN (CANADA), LTD.,
36 Malley Road, Scarborough, Ontario, Canada, Area 416-752-1790
CYPRANE LIMITED, New Devonshire House, Scott Street, Keighley, Yorkshire, England





A 4399

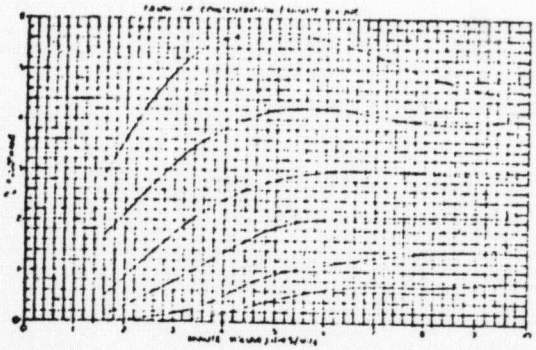
R SWEATMAN INCORPORATED

AE VAPORIZE

FS-71

EX-13

PERFORMANCE INFORMATION



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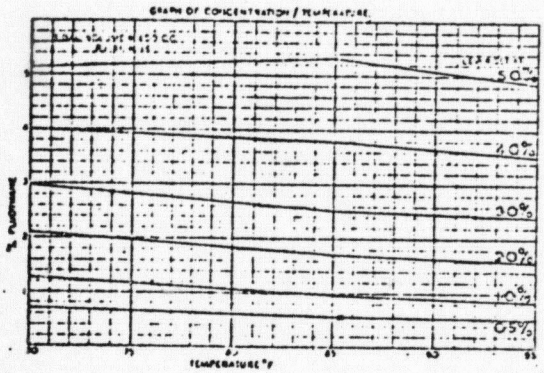


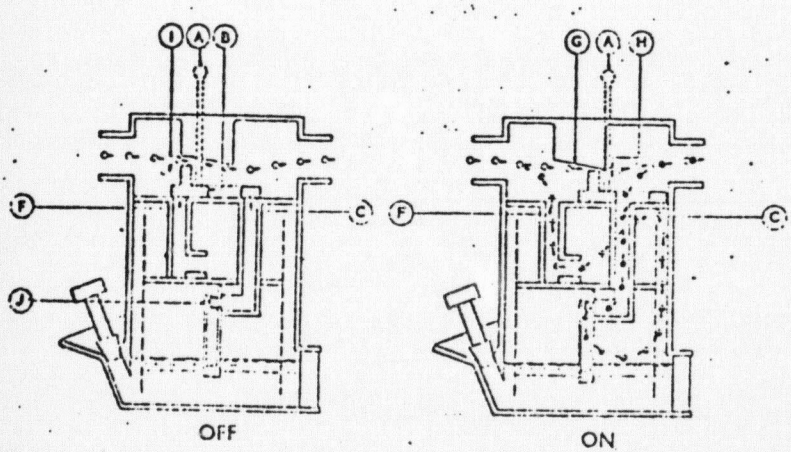
2

The AE Vaporizer is calibrated for Fluothane from 0.5% to 5.0%. Figures 1 and 2 illustrate typical performance.

Inspired Resistance of the AE is as follows:

Dial Setting	Inspiration Resistance mmH_2O	Flow
Off	6.35	30 LPM
2%	8.75	30 LPM
4%	11.5	30 LPM
5%	15.4	30 LPM

PRINCIPLE OF OPERATION



The AE Vaporizer is non-spillable to prevent sudden administration of excessive concentrations if the equipment is accidently inverted.

With the control (A) in the "Off" position, the valve (B) covers and seals the inlet and outlet tubes (F) and (C). Air is free to pass through the gap (I) in the top cover as shown by the arrows O⟶. As the control (A) is moved from the "Off" position, the valve (B) first re-opens the ports (F) and (C) to and from the vaporizing chamber. Some of the main stream of gas can now pass through the vaporizing chamber, as shown by the arrows. ⊖⟶

The gap (I) is formed by the top of the valve (B) and the sloping face (G) and consequently as the valve (B) is moved, the gap (I) is reduced to (H) at the maximum percentage position.

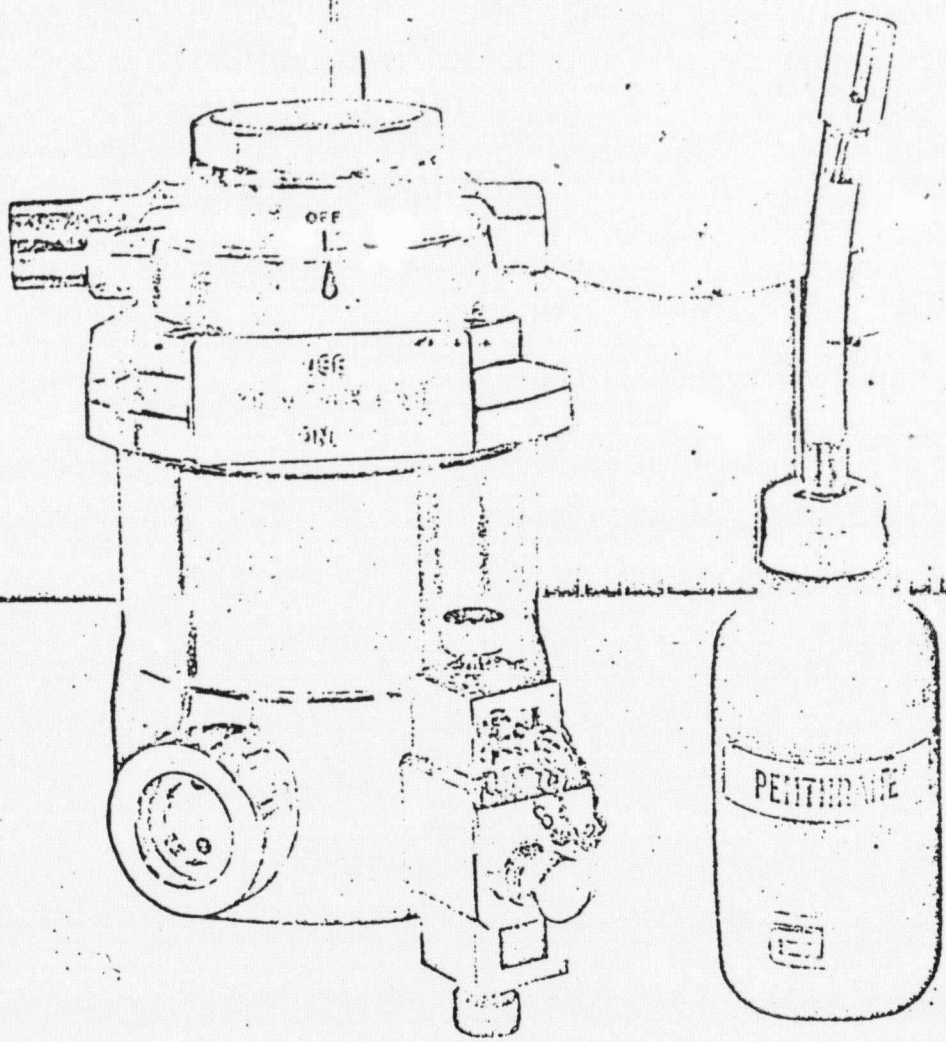
The reduction of this gap causes a greater proportion of the main air to be directed into the vaporizing chamber, with a corresponding increase in the delivered concentration in the outlet.

The thermostat (J) adjusts the air flow through the vaporizing chamber in relation to the temperature.

A4400

CX-139-A

THE Penteo Tank FOR PENTHRANE



FOR SAFETY

Equipped with THE PIN SAFETY SYSTEM

A 4401

CX-137-

THE Pentec Mk. II FOR PENTHRANE™

EQUIPPED WITH THE PIN SAFETY SYSTEM

Since the introduction in 1963, of the PENTEC MK. II, Cyprane Limited have been working on an improved design together with a solution to the problem of the inadvertent filling of the PENTEC with an agent such as Fluothane™ for which it had not been calibrated.

The PENTEC MK. II has been completely redesigned and its performance considerably improved in the light of experience gained with the earlier model, and recent trends in the administration of PENTHRANE™.

Up to dial setting of 2 volumes % at room temperature the output of any setting is independent of flow rate, pressure fluctuations due to the use of respirators, duration of use, and even at temperatures as high as 95°F temperature compensation keeps the concentration within safe limits.

Each PENTEC MK. II is calibrated at each dial setting up to 2.0 volumes % and at three different temperatures (68°F., 85°F., 95°F).

We believe that this vaporizer has taken into account all of the conditions necessary for the safest possible administration of PENTHRANE™.

Performance Characteristics

The PENTEC MK. II has unusually fine performance characteristics. For practical purposes it can be considered linear at room temperature up to 2.0 volumes % dial settings (Fig. 1) and flows of .5 l/m. Slight deviation at higher flows and dial settings of F.1.5.% and over occur.

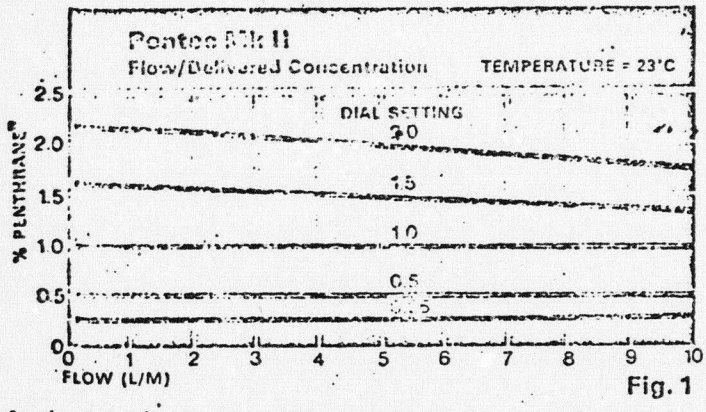


Fig. 1

At the 2.0 volumes % setting the control dial is equipped with an automatic Safety Stop.

The Safety Stop can be released so that the control dial can be turned to the Max. position by depressing the Safety Stop with one finger of the right hand, keeping the left hand free for other purposes.

Referring to (Fig. 2) the performance of the vaporizer is recorded from 65°F (approx. 18°C) to 95°F (approx. 35°C) and at 95°F the delivered concentration is still below 4.0 volumes %. Even at 36°C the concentration does not exceed 4 volumes %.

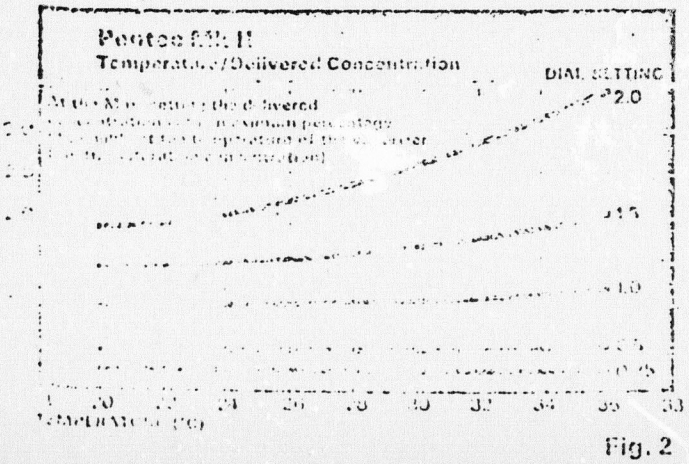


Fig. 2

Abbott Laboratories in their professional literature state as follows: "Methoxyflurane is not flammable except at abnormally high vapour concentrations and temperatures, that is, above 4% and above 75°C (167°F).

If reference is made to (Fig. 3) it will be noted that at 95°F the vapour pressure of PENTHRANE® in mm/Hg. is 50.5 or a concentration of 6.6 volumes %.

Vaporizer Temperature °C	20	25	30	35
Vaporizer Temperature °F	68	77	86	95
Vapor Pressure Methoxyflurane** mm/Hg.	23.0	30.5	39.5	50.5
Max. Concentration (Vol./%)	3.0	4.0	5.2	6.6

1. Vapor pressure of Methoxyflurane
2. Calculated in accordance with:

$$\text{Max. \% Penthrane®} = \frac{\text{Vapor Pressure}}{760} \times 100\%$$

(S.L. Atmospheric Pressure = 760 mm/Hg.)

Fig. 3

At a temperature of 85°F the concentration is approximately 5.2 volumes %. Many air-conditioned operating rooms will be at temperatures of 85°F depending on the ambient temperature and would be relatively cool only by comparison. It was, therefore felt that a Safety Stop was indicated so that the operator, because he must depress the Safety Stop to enter the Max. position, would know that he was in the operating area where the vapour pressure and concentration were totally dependent on temperature. He would also realize that the protective temperature compensation feature of the vaporizer was no longer applicable. All metered gases are passing through the vaporizing chamber at Max. setting where concentration is dependent on temperature only.

In addition to these questions, the clinical behaviour of PENTHRANE® at high temperatures and higher concentrations (and, therefore, increased doses) might be different from what one would normally expect. The possibility of the patient being in deeper planes of anesthesia than anticipated should be considered. This is contrary to recent recommended techniques where patients are carried in very light anesthetic planes made possible by the analgesic potency of Methoxyflurane."

A 4402 CX-137-C

Referring to (Fig. 4) the ability of the PENTEC MK. II to maintain Max. concentration at room temperature over long periods of time at a 5 l/m flow is illustrated. It is almost linear at all dial settings from 2% down.

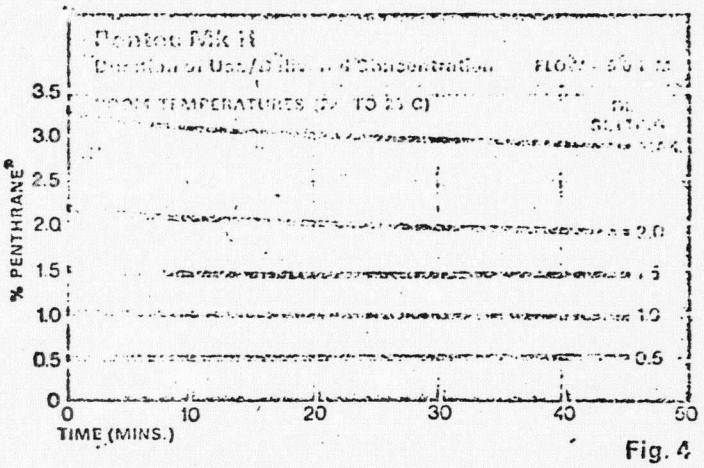


Fig. 4

RESISTANCE TO FLOW

The problem of resistance to flow is of sufficient concern to require special emphasis.

Vaporizers designed for linear performance at low flows offer much higher resistances than the PENTEC MK. I.

Since many vaporizers are mounted on a table top and attached by taking the rubber gas conducting tube off the absorber, placing it on the inlet of the vaporizer, and adding a second tube from the outlet of the vaporizer back to the absorber, it will be realized that on most Anesthesia Machines the vaporizer is downstream of flush gas flows.

The vaporizer, therefore, may be subjected to flush flow conditions as high as 70 l/m. Since most pipe lines and reducing valves are set at approximately 50 p.s.i., high resistances to flow will cause high upstream pressures when set at the ON position.

Since it may be undesirable to subject the upstream areas of the Anesthesia Machine, including flowmeters and other upstream vaporizers, to excessive pressures, the addition of a pressure release valve at the inlet of the vaporizer was considered but rejected for the following reasons:

1. The relief valve is hidden and if it is not competent or if it did not close properly, because of spring malfunction, a hidden leak might be created in the vaporizer causing it to deliver a lower concentration than that indicated on the dial. We were unsuccessful in designing or in purchasing a relief valve where this could not happen and under test did not happen.
2. If the relief valve was not cracked with reasonable frequency it was capable of sticking, thereby causing possible high back pressures which might become excessive before the valve cracked.
3. In the Heidbrink® Cabinet Models, series 1000 through 4000 a pressure relief valve has been installed in the gas line and is placed under the table top. This valve is set to crack at between 130 and 150 mm/Hg. This could be a second source of hidden leak which might be caused by high downstream back pressure.

Therefore, downstream resistances appear to us to offer two considerations:

First, a patient may have been administered one of the relaxant agents and because of a leak in a vaporizer pressure release by-pass valve lower concentrations than dial setting might be delivered to the patient without clinical response.

Second, with equipment already in the field, under back pressure conditions in excess of 130 mm/Hg. unexpected dissipation of a portion of the gas to atmosphere may occur.

The safest course to us, therefore, seemed to be to instruct the operator to turn his PENTECK MK. II to the OFF position before flushing.

FOR SAFETY

THE Pentec Mk. II PERFORMANCE WITH RESPIRATORS

The so-called pumping effect on vaporizers first mentioned by Hill and Lowe (1) is shown in Fig. 5.

It will be noted that the effect of respirators is negligible on the output of the PENTEC MK. II.

Column A gives the concentration delivered with steady unidirectional flows where the outlet pressure from the vaporizer is constant. Column B gives the delivered concentration when the pressure at the vaporizer outlet is fluctuating. The pressure fluctuated between 0 and 28 cm water at 16 R.P.M.

Typical results at 22°C			
Dial Setting	Input Flow to Vaporizer (litres/min)	% Penthrane® for Continuous Flow (A)	% Penthrane® with fluctuating back pressure (B)
0.5	0.50	0.47	0.47
2.0	0.50	1.98	1.95
0.5	1.0	0.48	0.48
0.5	2.0	0.49	0.49

Fig. 5

A 4403

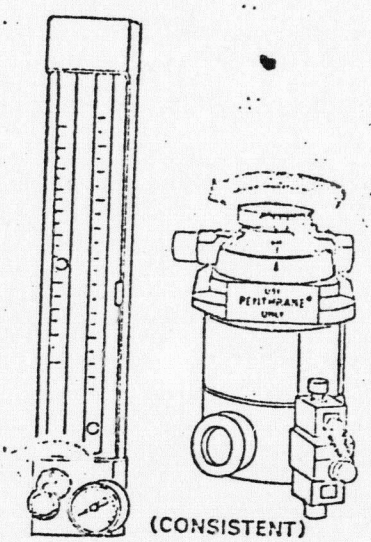
CX-139-D

Operation of Concentration Dial

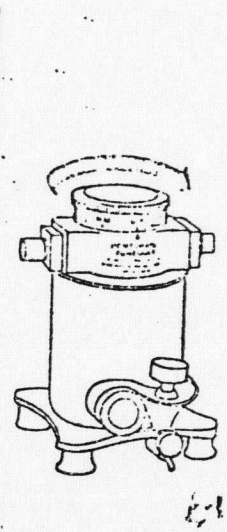
FOR SAFETY

Cyprane Vaporizers have all been designed to follow a consistent policy in common use on Anesthesia Machines with respect to the rotation of the control dial from OFF to ON and vice versa. Needle valves on all Anesthesia Machines are rotated counter clockwise to turn ON and clockwise to turn OFF. The original Pentec followed this practice and the practice has been continued with the PENTEC MK. II.

The Vapor® Vaporizer of Dräger, and the Fluomatic® of Foregger, have concentration dials which operate in the opposite direction and are the reverse of conventional needle valves, Fluotecs and Pentecs.



(CONSISTENT)



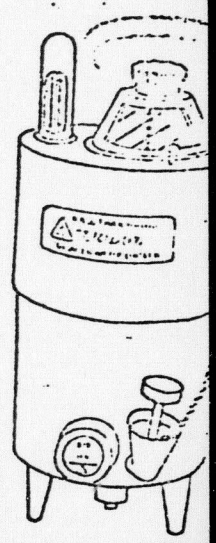


Fig.

Therefore, it should be noted that where Dräger or Foregger vaporizers are mounted in series with the vaporizers of Cyprane, Cyprane have followed conventional practice and these vaporizers are turned ON when turned counter clockwise, and OFF when turned clockwise.

Dräger and Foregger Vaporizers follow a contrary policy and are turned ON with a clockwise motion and OFF with a counter clockwise turn.

Care must, therefore, be taken that the Dräger and Foregg Vaporizers when mounted with Cyprane Vaporizers are turned full ON accidentally.

The PENTEC MK. II dial has a clicker which offers some resistance to turning. It is unlikely that the concentration could be changed by someone brushing an arm against the dial, as each click is well marked. Furthermore, the OFF position is full stop, clearly felt and firm.

WHY THE FS PIN SAFETY FOR ALL VAPORIZERS?

FOR SAFETY

In recent years, several volatile anesthetic agents of awesome potency have been devised and some of them brought to market. Many others are currently being investigated and clinically tested.

In order to increase the safety with which these potent agents can be administered it has been found advantageous to design specially calibrated vaporizers for each agent.

Morris J. Nicholson, M.D., drew to the attention of the profession in a "Case History" (2) where Trichloroethylene was mistakenly used in a vaporizer thought to contain Fluothane®.

Among his several penetrating comments on this problem the most pertinent is quoted below:

> *"(3) Are we in an untenable position when organized anesthesia rigidly enforces a uniform international color code for the identification of tanks containing compressed gases which must be used in conjunction with noninterchangeable pin-indexing systems, while at the same time a variety of vaporizers may be filled with powerful liquid anesthetic agents whose identity is lost as soon as they are poured from the manufacturer's can or bottle?"*

In addition to the hazard of any agent being put into a vaporizer which had been calibrated for another agent, Fig. 7 illustrates what would happen if Fluothane® was accidentally placed in both the PENTEC MK. I and the new PENTEC MK. II at various dial settings, and also at the Max. position in the PENTEC MK. II. At this position saturated Fluothane® vapour would be delivered to the patient.

It would appear that with the multiplicity of new agents under investigation the time has now come for precautionary measures to be taken to prevent this hazard from accidentally occurring in the Operating Room and vaporizers for all agents should be equipped with the FS Pin Safety System.

In conclusion, we believe that the PENTEC MK. II has taken into account all of the potential hazards presently foreseeable and offers the profession the highest standard available in both safety and performance.

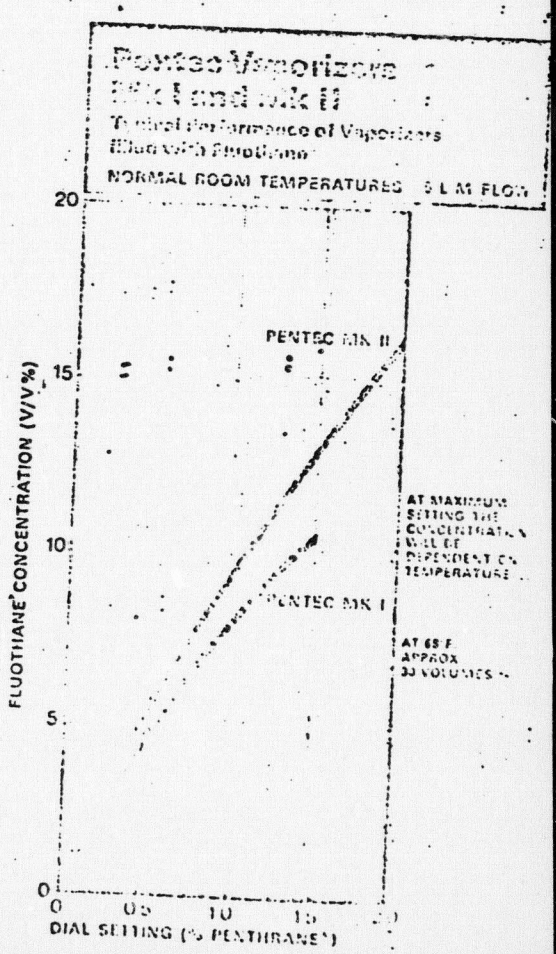


Fig. 7.

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Operating Principles

FOR SAFETY

The PENTEC MK. II is shown diagramatically in Figures 8 and 9. Figure 8 shows the Vaporizer in the OFF position. Figure 9 shows the Vaporizer with the control dial in the normal working range of 0.25 to 2.0% PENTHRANE® and Figure 10 shows the vaporizer with the dial set at MAX. The PENTEC MK. II is shown fitted with the F.S. Pin Safety System. Figure 12 gives a diagramatic representation of the Bottle Adaptor for the F.S. Pin Safety System.

Control of the concentration of PENTHRANE® delivered by the PENTEC MK. II is effected by rotation of a single control knob. Movement of this control knob rotates a flat specially treated rotary valve, which should eliminate sticking which opens and closes appropriate ports and controls the proportion of gas passing through the vaporizing chamber. Temperature compensation is achieved automatically by the action of a temperature sensitive element on a valve which appropriately increases or decreases the amount of gas by-passing the vaporizing chamber.

In the OFF position (Fig. 8), metered gas enters the vaporizer at the inlet A as shown by the arrows. and passes through a filter (not shown). The gas then flows along channels B and F in the rotary valve and leaves the vaporizer at J. A small proportion of the flow passes through the temperature sensitive valve M and joins up with the main flow which has passed through channel F. When the valve is in the OFF position the inlet to and the outlet from the vaporizing chamber are closed to the gas stream and no PENTHRANE® can enter the gas circuit.

As the control knob E is turned to a calibrated position the ON position is reached (Figure 9).

In this position the outlet from channel F has been closed and the inlet port D into the vaporizing chamber is opened. The outlet (H) from the sump is also opened and gas can flow through the control channel Z.

In the ON position (Fig. 9) metered gas enters at A and splits into two streams when leaving channel B. One stream passes through the temperature sensitive valve M and flows to the outlet J. The other stream passes through port D and enters the vaporizing chamber where there is very close contact between the gas stream and a wick system. The gas becomes saturated with PENTHRANE® vapour and leaves the vaporizing chamber through port H.

From port H the gas flows into the control channel Z. This control channel is long and wide in relation to the depth. Rotation of the control knob E exposes different parts of the control channel to the gas flow. The effective depth of channel Z increases as the dial is moved to a position which will give an increased PENTHRANE® concentration.

When the gases which have passed through the vaporizing chamber leave channel Z the flow combines with the flow which has passed through the temperature sensitive valve and leaves the vaporizer through the outlet J.

The delivered concentration is determined by the relative resistance to flow of the temperature sensitive valve M and the control channel Z.

In the MAX position (Fig. 10) the inlet to the temperature sensitive valve, M is closed by rotation of the control valve. In this position all the gas entering the vaporizer passes through the vaporizing chamber and there is, consequently no temperature compensation. For this reason the MAX position can only be reached by the simultaneous depression of a catch (not shown) and rotation of the knob E. This safety catch does not have to be depressed to move out of the MAX position but must be depressed every time the control is moved from 2.0% PENTHRANE® to MAX.

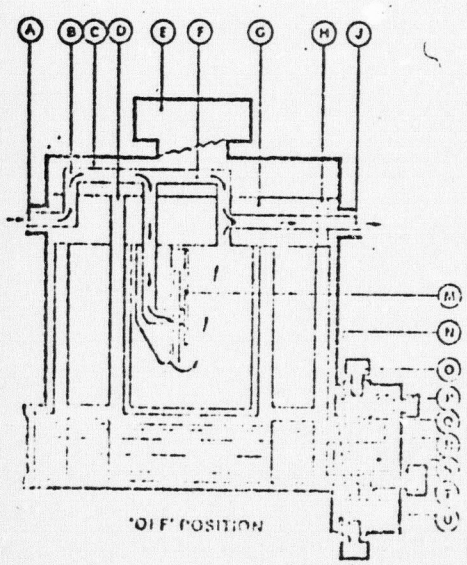

Fig. 8

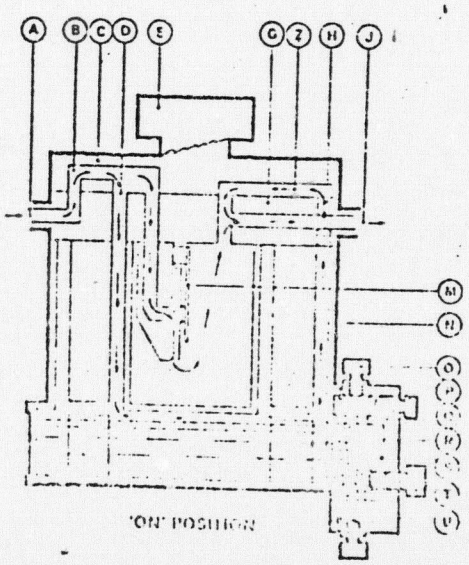

Fig. 9

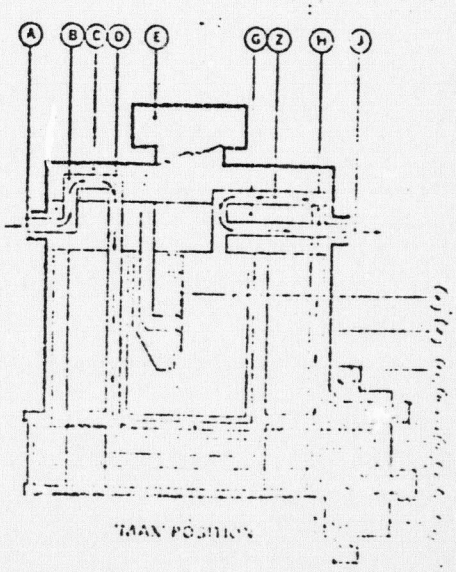

Fig. 10

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PIN SAFETY SYSTEM

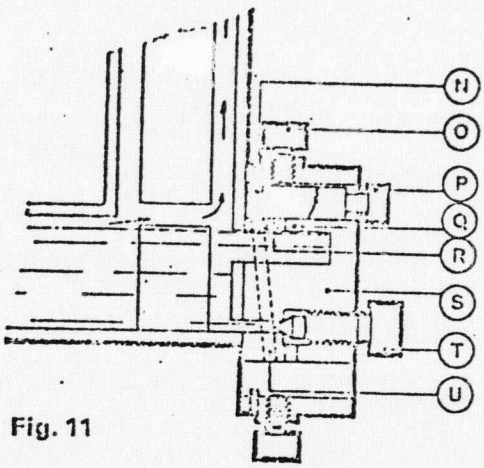


Fig. 11

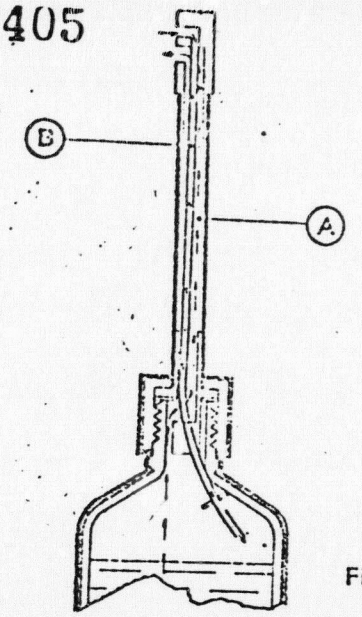


Fig. 12

The F.S. Pin Safety System is a device for ensuring that the vaporizer is filled only with the drug for which the vaporizer was originally calibrated. With the system the vaporizer can be filled quickly without spilling any PENTHRANE® and the danger of overfilling is avoided.

The system consists of two parts:—the combined filler and drain unit attached to the vaporizer (as shown in. Figure 11) and the bottle unit (as shown in Figure 12)

The bottle adaptor consists of a cap which will fit only the PENTHRANE® bottle. Attached to this cap are two flexible tubes. On the delivery end of these two tubes is attached a plug which fits into a socket in the filler drain unit. This filler socket is normally sealed by a blank plug (P). By a special pin identification system the plug attached to the PENTHRANE® bottle can only be fitted into the filler or drain sockets on a PENTEC vaporizer.

When a PENTEC MK. II vaporizer is filled the blank plug (P) is removed after loosening the retaining screw (O). The plug on the bottle unit is inserted in place of the blank plug with the holes down, the retaining screw is tightened and the bottle is raised to a level higher than the level of the filler. PENTHRANE® liquid flows down the outer tube (A) and enters the vaporizer at (Q). The displaced air passes out of the vaporizer at (R) and up the inner tube (B). When the liquid level has risen to the level of the air outlet hole (R) which corresponds to the FULL mark on the filler window the flow will automatically stop because no more air can be displaced.

For draining purposes the plug on the bottle adaptor is fitted into the drain with the holes in the plug uppermost and the retaining screw is tightened. The drain tap (T) is opened (counter clockwise) and liquid PENTHRANE® flows out of the vaporizer and down the outer tube (A). The displaced air in the PENTHRANE® bottle passes up the inner tube (B) and is vented to atmosphere via duct (U).

REFERENCES: (1) Hill, D. W., and Lowe, H. J.: Comparison of concentration of Halothane in closed and semi-closed circuit during controlled ventilation. Anesthesiology 23: 291, 1962.

(2) Nicholson, M. J., Accidental use of Trichloroethylene in a Closed System: Anesthesia and Analgesia, Vol. 43, # 6, Nov./Dec. 64, 740-743.

SERVICE POLICY

The PENTEC MK. II is unconditionally guaranteed against faulty workmanship or material for a period of twelve months from date of purchase.

We recommend that every PENTEC MK. II be serviced in each year following the expiration of the guarantee period.

Experience has demonstrated that residual contamination from continued use of vaporizers should be removed to ensure maximum purity of the drug. An Annual Service Contract is available at $45.00 per annum and Fraser Sweatman Inc. will be pleased to advise the hospital of the dates when servicing is due.

ASSOCIATED COMPANIES

Fraser Sweatman Incorporated & Service and Repair Facility

Fraser Sweatman (Canada) Limited

Cypress Limited
NEW [illegible] HOUSE, SCOTT STREET, KESWICK, ENGLAND

CONDUCTIFLEX ACCESSORIES

A 4406

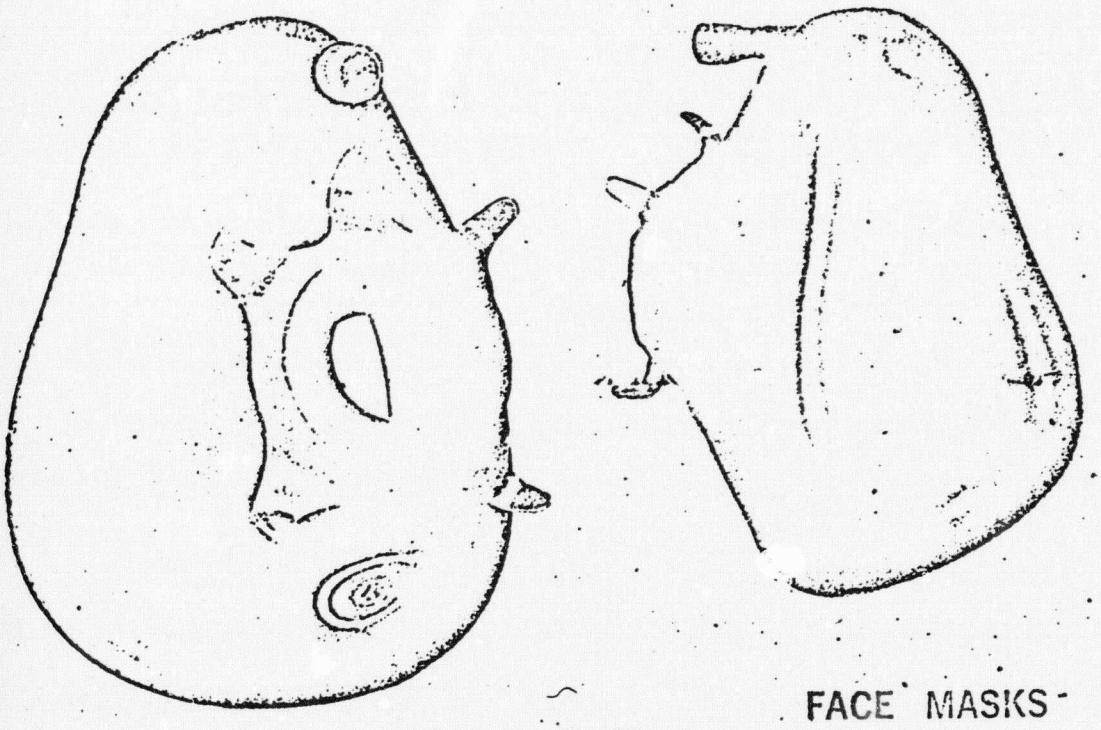
FSC 569

EX-140-A

CONDUCTIFLEX Conductive Anesthesia accessories are manufactured of long lasting, highly durable NEOPRENE.

These products will far outlast natural rubber accessories—even with frequent aseptic procedures. Deterioration brought on by volatile agents is minimized. Smudging and other characteristics of aging are virtually eliminated.

Conductiflex accessories are individually packaged with clearly labelled identification including cleaning instructions, and reordering information.



FACE MASKS

Conductiflex contour fit face masks have an inflatable cushion to insure snug fit and prevent leakage. Designed to minimize dead space. Smooth surface—inside and out—for elimination of foreign particles.

Long life conductive neoprene. Easy to clean. Supplied in seven sizes with 7/8" (22.2 mm) connecting bushing and 5 prong hook ring to accommodate all standard head harnesses.

600900—Conductiflex Mask	Size 0, small infant
600901—Conductiflex Mask	Size 1, infant
600902—Conductiflex Mask	Size 2, child
600903—Conductiflex Mask	Size 3, small adult
600904—Conductiflex Mask	Size 4, medium adult
600905—Conductiflex Mask	Size 5, large adult
600906—Conductiflex Mask	Size 6, extra large adult

FACE MASKS

7 sizes

Infant
Child
Adult

BREATHING TUBES

36" Length

REBREATHING BAGS

are dual purpose with lower extension suitable for cutting

2-sizes—square
4-sizes—oval

HEAD HARNESS

Four tail style
Adjustable

Child
Adult

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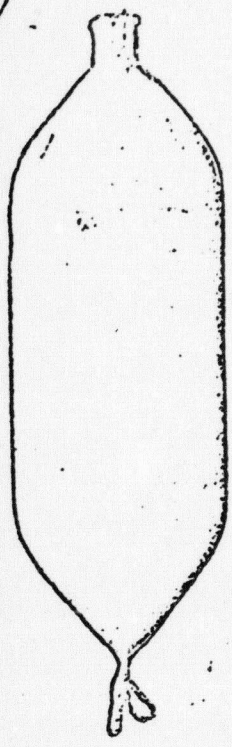
5490 Broadway, Lancaster, New York 14086

ASSOCIATED COMPANIES/
Fraser Sweatman (Canada) Ltd., 35 Valley Road, Scarborough 705, Ontario, Canada
Cyprane Limited, West Lane, Keighley, Yorkshire, England

CX-190-D

REBREATHING BAGS *DUAL PURPOSE

A 4407

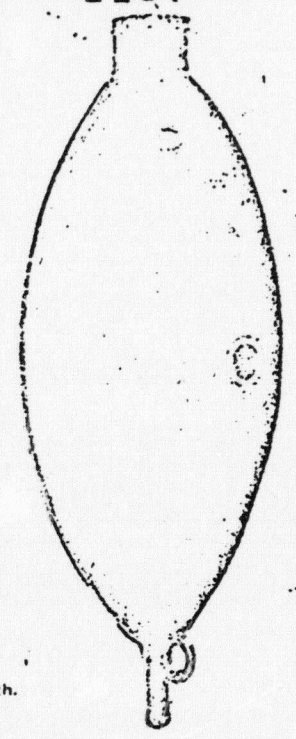


SQUARE

The square reservoir bag in conductive neoprene can be comfortably used by the smallest hand accentuating the sensory testing of compliance.

Available in 3.5 liter and 5 liter sizes with standard ⅞" (22.2 mm) I.D. bushing.

610935...3.5 liter bag
610950...5 liter bag



OVAL

Manufactured from conductive neoprene

Shaped to universal oval style. Available in four sizes:

1 Liter
2 Liter
3 Liter
5 Liter

Inlet is standard ⅞" (22.2 mm) I.D. bushing.

610901...1 Liter Bag
610902...2 Liter Bag
610903...3 Liter Bag
610905...5 Liter Bag

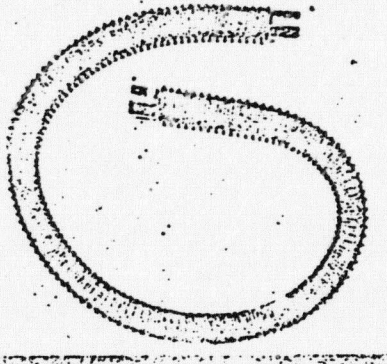
*All Conductiflex Rebreathing Bags have closed lower extension which can be cut to convenient length. A loop is provided to facilitate drying.

BREATHING TUBES

All tubes manufactured of conductive neoprene with ⅞" (22.2 mm) I.D. fitting. Available in 36" lengths.

This extra lightweight breathing tube is designed for maximum flexibility and resistance to kinking and turbulence. Extension characteristics are minimized and smooth inside and outside surface facilitates cleaning.

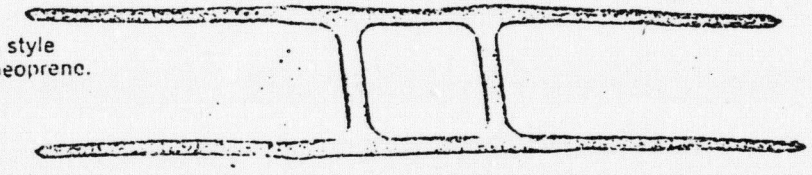
620936....Breathing Tube, 36"



HEAD HARNESS

The Conductiflex Head Harness is four tail style with wide range adjustability; conductive neoprene. Available in adult and child size.

630900...Adult Head Harness
630901...Child Head Harness



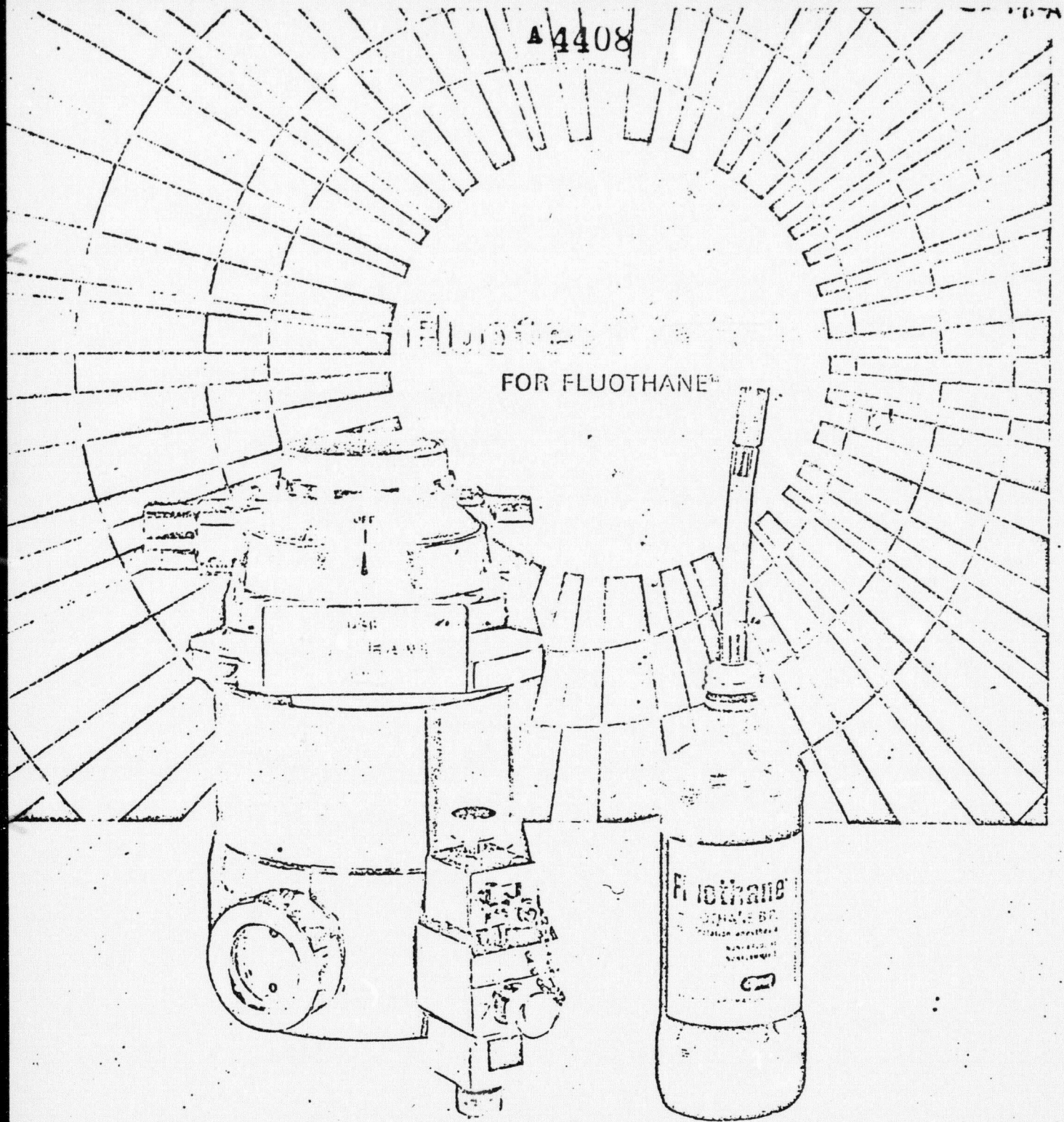
CONDUCTIFLEX WARRANTY

Conductiflex Accessories are guaranteed against defective material and workmanship for a period of 60 days from date of shipment. The Company's only liability shall be to replace defective goods without charge.

SUGGESTED CARE OF CONDUCTIVE ACCESSORIES

1. Article should be washed in a medical soap or detergent. Rinse in clean water.
2. Dry the surface and hang or loop to dry.
3. Conductive accessories should be stored in a cool, dark area away from excessive heat or sunlight.

A 4408



FOR SAFETY

Equipped with THE PIN SAFETY SYSTEM

4409 CX-141

THE Fluotec Mk III FOR FLUOTHANE®

EQUIPPED WITH THE PIN SAFETY SYSTEM

It is more than ten years since the FLUOTEC was introduced. During this time it has become standard equipment in almost every hospital in almost every country in the world. From time to time small modifications were introduced but the basic design was never changed.

In the light of the experience gained with the earlier model, we now introduce the FLUOTEC MK. III which is a completely new design with considerably improved performance. The output at any given dial setting is independent of flow rate, temperature variations, duration of use, and pressure fluctuations due to the use of respirators. (1) The vaporizer should not be inverted when charged.

Performance Characteristics

The FLUOTEC MK. III has outstanding flow and temperature compensation qualities.

At room temperature and at 5 litre flows the vaporizer is virtually linear. (Fig. 2).

With reference to (Fig. 1) the temperature compensation is illustrated from 20°C to 36°C (approximately 68°F to 95°F).

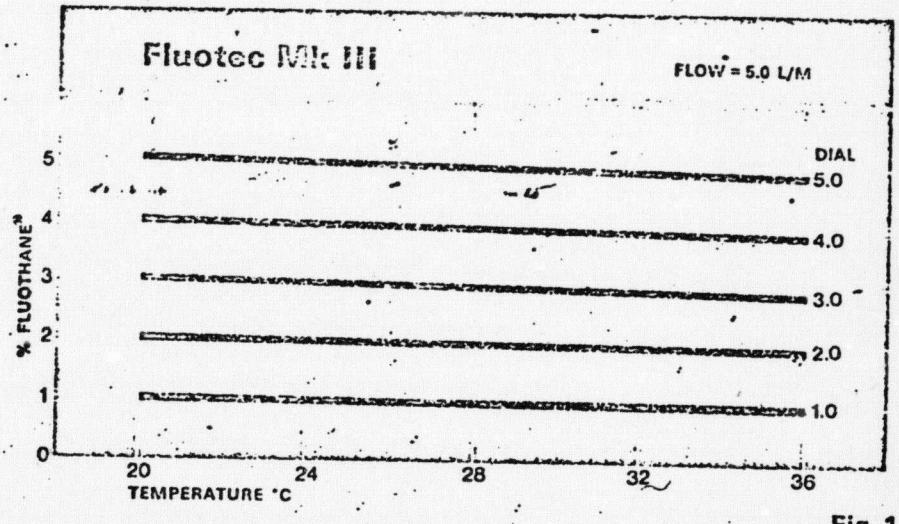


Fig. 1

FOR SAFETY

It should be noted that at higher temperatures the vaporizer is slightly over-compensated, unlike most vaporizers where under compensation requires somewhat closer attention at higher temperatures. We consider this an important Safety Feature of the FLUOTEC MK. III.

Referring to (Fig. 2) the performance of the FLUOTEC MK. III is shown with respect to FLUOTHANE concentration compared to flow. It will be noted that the maintenance settings are excellent down to 200 cc. per minute. At high flow rates of 10 l/m the fall off at the 5.0 volumes% setting is less than half of that found in most vaporizers of this type. Also temperature and flow compensation with the FLUOTEC MK. III has reached a new degree of perfection.

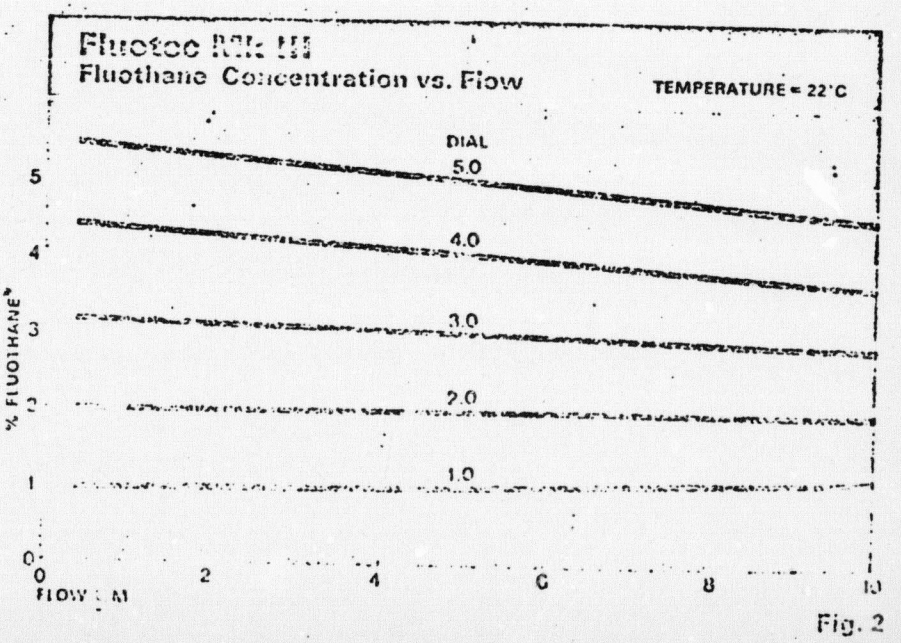


Fig. 2

A 4410

BACK PRESSURE COMPENSATION

The results in (Fig. 3) indicate the effects of back pressure or what is sometimes referred to as the Pumping Effect. (1)

Fig. 3 shows the effect of fluctuating back pressures on the FLUOTEC MK. III Vaporizer. These back pressure fluctuations could be caused by the use of respirators or manual assisted respiration in a circle type system.

Column A gives the concentration delivered with steady unidirectional flows where the outlet pressure from the vaporizer is constant. Column B gives the delivered concentration when the pressure at the vaporizer outlet is fluctuating. The pressure fluctuated between 0 and 28 cm water at 16 R.P.M.

Typical results at 22°C			
Dial Setting	Input Flow to Vaporizer (litres/min)	% Fluothane® for Continuous Flow (A)	% Fluothane® with fluctuating back pressure (B)
0.5	0.50	0.47	0.47
2.0	0.50	1.98	1.95
5.0	0.50	5.49	5.45
0.5	1.0	0.48	0.48
5.0	1.0	5.43	5.39
0.5	2.0	0.49	0.49
5.0	2.0	5.32	5.27

Fig. 3

RESISTANCE TO FLOW

The problem of resistance to flow is of sufficient concern to require special emphasis.

Vaporizers designed for linear performance at low flows offer much higher resistances than the FLUOTEC MK. II.

Since many vaporizers are mounted on a table top and attached by taking the rubber gas conducting tube off the absorber, placing it on the inlet of the vaporizer, and adding a second tube from the outlet of the vaporizer to the absorber, it will be realized that on many Anesthesia Machines the vaporizer is downstream of flush gas flows.

The vaporizer, therefore, may be subjected to flush flow conditions as high as 70 l/m. Since most pipe lines and reducing valves are set at approximately 50 p.s.i., high resistances to flow will cause high upstream pressures when set in the ON position.

Since it may be undesirable to subject the upstream areas of the Anesthesia Machine, including flowmeters and other upstream vaporizers, to excessive pressures, the addition of a pressure release valve at the inlet of the vaporizer was considered but rejected for the following reasons:

1. The relief valve is hidden and if it is not competent or it did not close properly, because of spring malfunction, a hidden leak might be created in the vaporizer causing it to deliver a lower concentration than that indicated on the dial. We were unsuccessful in designing or in purchasing a relief valve where this could not happen and under test did not happen.
2. If the relief valve was not cracked with reasonable frequency it was capable of sticking, thereby causing possible high back pressures which might become excessive before the valve cracked.
3. In the Heidbrink® Cabinet Models, series 1000 through 4000 a pressure relief valve has been installed in the gas line and is placed under the table top. This valve is set to crack at between 130 and 150 mm/Hg. This could be a second source of hidden leak which might be caused by high downstream back pressure.

   Therefore, downstream resistances appear to us to offer two considerations:

   First, a patient may have been administered one of the relaxant agents and because of a leak in a vaporizer pressure release by-pass valve, lower concentrations than dial setting might be delivered to the patient without clinical response.

   Second, with equipment already in the field, under back pressure conditions in excess of 130 mm/Hg. unexpected dissipation of gas to atmosphere may occur.

The safest course to us, therefore, seemed to be to instruct the operator to turn his FLUOTEC MK. III to the OFF position before flushing.

FOR SAFETY

A 4411

CX-141-D

Operation of Concentration Dial

FOR SAFETY

Cyprane Vaporizers have all been designed to follow a consistent policy in common use on Anesthesia Machines with respect to the rotation of the control dial from OFF to ON and vice versa. Needle valves on all Anesthesia Machines are rotated counter clockwise to turn ON and clockwise to turn OFF. The original FLUOTEC followed this practice and the practice has been continued with the FLUOTEC MK. III.

The VAPOR® Vaporizer of Dräger, and the FLUOMATIC® of Foregger, have concentration dials which operate in the opposite direction and are the reverse of conventional needle valves, FLUOTECS and PENTECS.

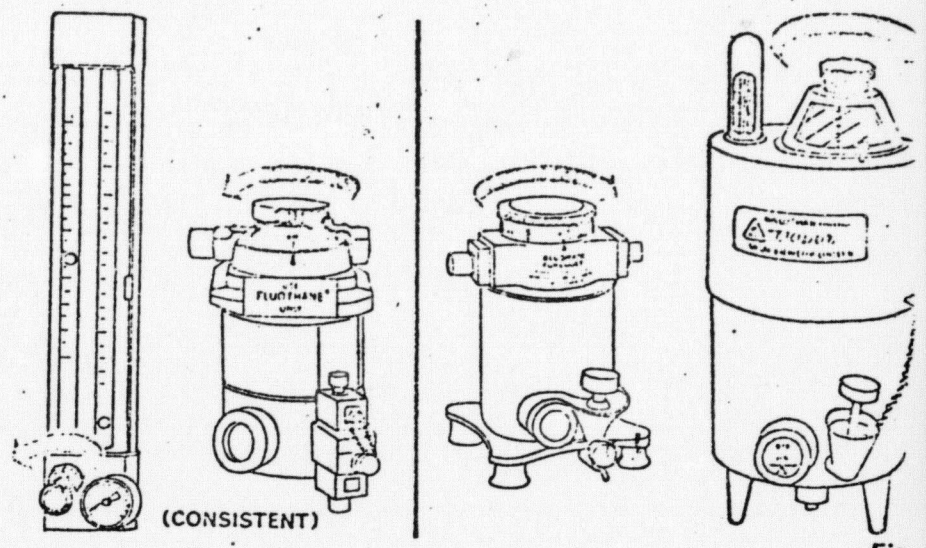


Fig.

Therefore, it should be noted that where Dräger or Foregger Vaporizers are mounted in series with the vaporizers of Cyprane, Cyprane have followed conventional practice and these vaporizers are turned ON when turned counter clockwise.

Dräger and Foregger Vaporizers follow a contrary policy and are turned ON with a clockwise motion and OFF with a counter clockwise turn.

Care must, therefore, be taken that the Dräger and Foregger Vaporizers are not turned full ON accidentally.

The FLUOTEC MK. III dial has a clicker which offers some resistance to turning. It is unlikely that the concentration could be changed by someone brushing an arm against the dial, as each click is well marked. Furthermore, the OFF position is a **stop**, clearly felt and firm.

WHY THE FS PIN SAFETY FOR ALL VAPORIZERS?

FOR SAFETY

The FS Pin Safety System on the new FLUOTEC MK. III is a simpler, more versatile system than the one we previously advertised but have obsoleted before sale.

With the multiplicity of volatile agents presently in use in Operating Rooms, the possibility of cross-contamination by either filling or topping up a vaporizer calibrated for a given agent with an agent for which it had not been calibrated becomes increasingly possible.

Cases have been reported in the literature where lethal accidents have occurred because the wrong drug had been put into a vaporizer and its identity lost as soon as it had left its labelled bottle. (2)

Morris J. Nicholson, M.D., drew to the attention of the profession in a Case History (2) where Trichlorethylene was mistakenly used in a vaporizer thought to contain FLUOTHANE®.

Among his several penetrating comments on this problem the most pertinent is quoted below:

> (3) *"Are we in an untenable position when organized anesthesia rigidly enforces a uniform international color code for the identification of tanks containing compressed gases which must be used in conjunction with non-interchangeable pin-indexing systems, while at the same time a variety of vaporizers may be filled with powerful liquid anesthetic agents whose identity is lost as soon as they are poured from the manufacturer's can or bottle?"*

In addition, many new drugs are being tested and one cannot tell whether their characteristics are such that they could offer lethal concentrations if placed in a FLUOTEC MK. III similar to the problem if FLUOTHANE® is placed in vaporizers calibrated for PENTHRANE®.

Therefore, it would appear the part of wisdom to protect all concerned by having your new FLUOTEC Vaporizers equipped with the FS Pin Safety System, or have your older Cyprane Vaporizers converted to Pin Safety if new ones are not required.

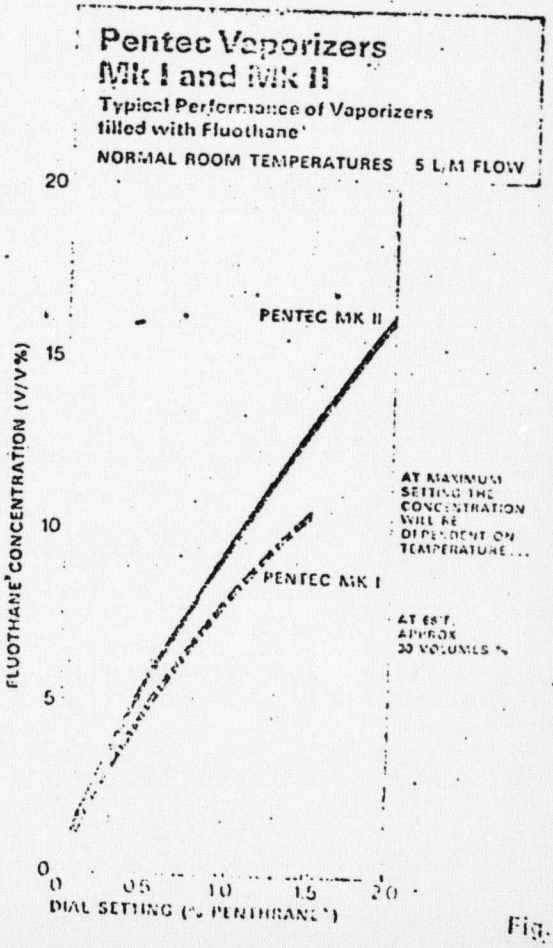


Fig.

CX-141-E

FOR SAFETY

Operating Principles

The FLUOTEC MK. III is shown diagramatically in Fig. 6 and Fig. 7. Fig. 6 shows the vaporizer in the OFF position. Fig. 7 shows the vaporizer with the control dial in the normal working range of 0.5 to 5.0 volumes %. The FLUOTEC is shown fitted with the FS Pin Safety System. Fig. 9 gives a diagramatic representation of the Bottle Adapter for the FS Pin Safety System.

Control of the concentration of FLUOTHANE® delivered by the FLUOTEC MK. III is effected by the rotation of a single control knob. Movement of this control knob rotates a flat, specially treated rotary valve, which should eliminate sticking, which opens and closes appropriate ports and controls the proportion of gas passing through the vaporizing chamber. Temperature compensation is achieved automatically by the action of a temperature sensitive element on a valve which appropriately increases or decreases the amount of gas by-passing the vaporizing chamber.

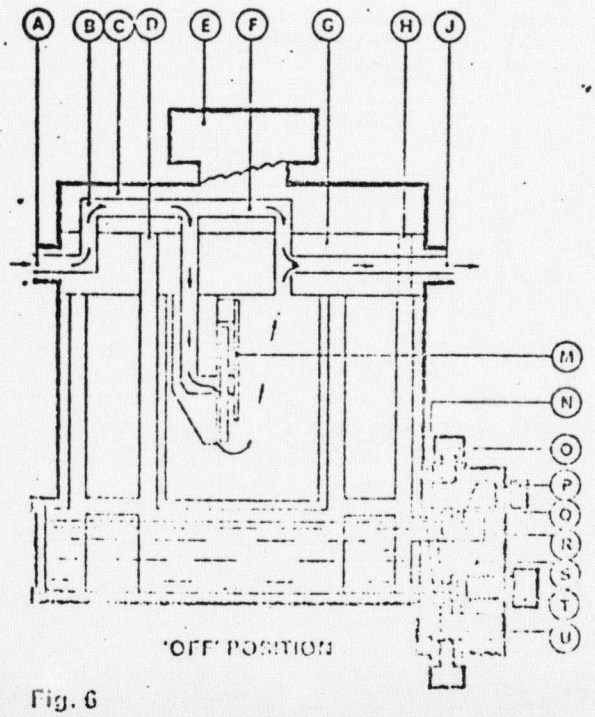
In the OFF position (Fig. 6) metered gas enters the vaporizer at the inlet A as shown by the arrows, and passes through a filter (not shown). The gas then flows along channels B and F in the rotary valve and leaves the vaporizer at J. A small proportion of the flow passes through the temperature sensitive valve M and joins up with the main flow which has passed through channel F. When the valve is in the OFF position the inlet to and the outlet from the vaporizing chamber are closed to the gas stream and no FLUOTHANE® can enter the gas circuit. As the control knob E is turned to a calibrated position the ON position i reached (Fig. 7).

In this position the outlet from channel F has been closed ar the inlet port D into the vaporizing chamber is opened. The ou let H from the sump is also opened and gas can flow throug the control channel Z.

In the ON position (Fig. 7) metered gas enters at A and soli into two streams when leaving channel B. One stream passe through the temperature sensitive valve M and flows to th outlet J. The other stream passes through port D and enters th vaporizing chamber where there is very close contact betw ee the gas stream and a wick system. The gas becomes saturate with FLUOTHANE® vapour and leaves the vaporizing chambe through port H.

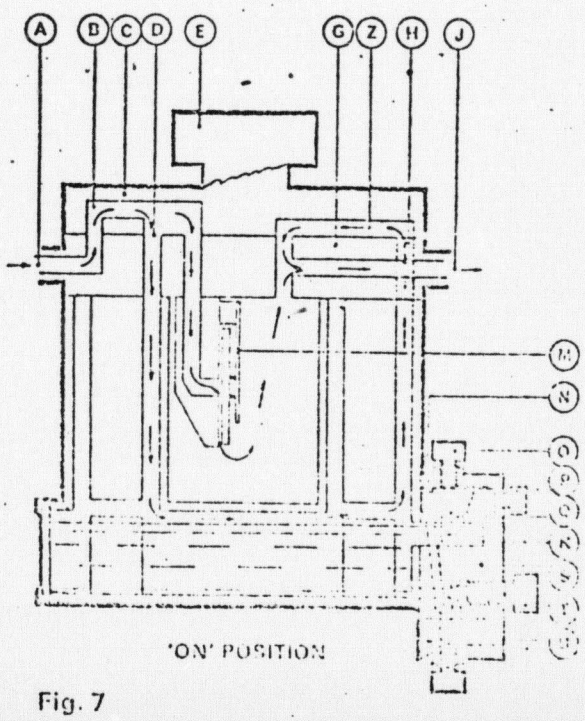
From port H the gas flows into the control channel Z. This con trol channel is long and wide in relation to the depth. Rotatio of the control knob E exposes different parts of this contro channel to the gas flow. The effective depth of channel Z increases as the dial is moved to a position which will give a increased FLUOTHANE® concentration.

When the gases which have passed through the vaporizing chamber leave channel Z the flow combines with the flow which has passed through the temperature sensitive valve and leaves the vaporizer through the outlet J. The delivered concentration is determined by the relative resistance to flow of the temperature sensitive valve M of the control channel Z.



'OFF' POSITION

Fig. 6



'ON' POSITION

Fig. 7

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PIN SAFETY SYSTEM

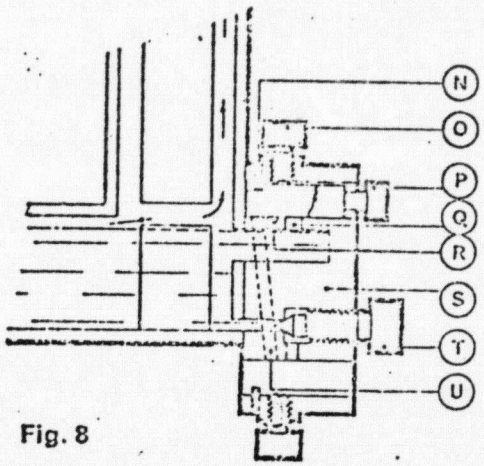

Fig. 8

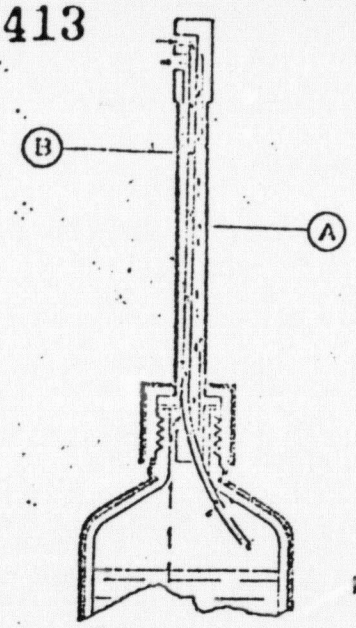

Fig. 9

The F.S. Pin Safety System is a device for ensuring that the vaporizer is filled only with the drug for which the vaporizer was originally calibrated. With the system the vaporizer can be filled quickly without spilling any FLUOTHANE® and the danger of overfilling is avoided.

The system consists of two parts:—the combined filler and drain unit attached to the vaporizer (as shown in figure 8) and the bottle unit (as shown in figure 9).

The bottle adaptor consists of a cap which will fit only the FLUOTHANE® bottle. Attached to this cap are two flexible tubes. On the delivery end of these two tubes is attached a plug which fits into a socket in the filler drain unit. This filler socket is normally sealed by a blank plug (P). By a special pin identification system the plug attached to the FLUOTHANE® bottle can only be fitted into the filler or drain sockets on a FLUOTEC MK. III vaporizer.

When a FLUOTEC MK. III vaporizer is filled the blank plug (P) is removed after loosening the retaining screw (O). The plug on the bottle unit is inserted in place of the blank plug. With the holes down, the retaining screw is tightened and the bottle is raised to a level higher than the level of the filler. FLUOTHANE® liquid flows down the outer tube (A) and enters the vaporizer at (Q). The displaced air passes out of the vaporizer at (R) and up the inner tube (B). When the liquid level has risen to the level of the air outlet hole (R) which corresponds to the FULL mark on the filler window the flow will automatically stop because no more air can be displaced.

For draining purposes the plug on the bottle adaptor is fitted into the drain with the holes in the plug uppermost and the retaining screw is tightened. The drain tap (T) is opened (counter clockwise) and liquid FLUOTHANE® flows out of the vaporizer and down the outer tube (A). The displaced air in the FLUOTHANE® bottle passes up the inner tube (B) and is vented to atmosphere via duct (U).

REFERENCES: (1) Hill, D. W., and Lowe, H. J.: Comparison of concentration of Halothane in closed and semi-closed circuit during controlled ventilation. Anesthesiology 23: 291, 1962.

(2) Nicholson, M. J., Accidental use of Trichloroethylene in a Closed System. Anesthesia and Analgesia. Vol. 43, # 6, Nov./Dec. 64, 740-743.

SERVICE POLICY

The FLUOTEC MK. III is unconditionally guaranteed against faulty workmanship or material for a period of twelve months from date of purchase.

We recommend that every FLUOTEC MK. III be serviced in each year following the expiration of the guarantee period.

Experience has demonstrated that residual contamination from continued use of vaporizers should be removed to ensure maximum purity of the drug. An Annual Service Contract is available at $45.00 per annum and Fraser Sweatman Inc. will be pleased to advise the hospital of the dates when servicing is due.

ASSOCIATED COMPANIES

Fraser Sweatman Incorporated & Service and Repair Facility

Fraser Sweatman (Canada) Limited

Cyprane Limited

A 4414

EX-PL-3

FRASER SWEATMAN INCORPORATED

5490 BROADWAY

LANCASTER, NEW YORK 14086

#716-684-0564

MAY 1, 1972

FRASER SWEATMAN HOSPITAL ANESTHESIA PRODUCTS PRICE SHEET

RETURNS

AUTHORIZATION FROM THIS COMPANY MUST FIRST BE RECEIVED, BEFORE MERCHANDISE IS RETURNED. A HANDLING CHARGE OF 10% PLUS ALL SHIPPING CHARGES WILL BE MADE ON EQUIPMENT ACCEPTED FOR CREDIT. ITEMS ARE NOT RETURNABLE AFTER 60 DAYS FROM DATE OF ORIGINAL SHIPMENT.

WARRANTY INFORMATION

ANESTHESIA MACHINES

ANESTHESIA MACHINES AND FS-68 ABSORBERS ARE GUARANTEED FOR ONE (1) YEAR FROM THE DATE OF DELIVERY AGAINST ANY DEFECT IN WORKMANSHIP. THE PART OR PARTS WILL BE REPLACED.

VAPORIZERS

THE FLUOTEC AND PENTEC VAPORIZERS ARE UNCONDITIONALLY GUARANTEED AGAINST FAULTY WORKMANSHIP OR MATERIAL FOR A PERIOD OF TWELVE (12) MONTHS FROM DATE OF PURCHASE.

*ALL PRICES F.O.B. LANCASTER, NEW YORK

*PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

*TERMS NET 30 DAYS.

QUANTIFLEX RIGID FRAME

STOCK NO.	DESCRIPTION	PRICE
102410	Quantiflex R.F., 2 gas, 4 yoke, 1 drawer	$1015.00
102430	Quantiflex R.F., 2 gas, 4 yoke, 3 drawer	1095.00
102210	Quantiflex R.F., 2 gas, 2 yoke, 1 drawer	960.00
102230	Quantiflex R.F., 2 gas, 2 yoke, 3 drawer	1040.00
103510	Quantiflex R.F., 3 gas, 02-N20-C3H6, 5 yoke, 1 drawer	1130.00
103511	Quantiflex R.F., 3 gas, 02-N20-Air, 5 yoke, 1 drawer	1215.00
103512	Quantiflex R.F., 3 gas, 02-N20-He, 5 yoke, 1 drawer	1215.00
103513	Quantiflex R.F., 3 gas, 02-N20-C02, 5 yoke, 1 drawer	1215.00
103514	Quantiflex R.F., 3 gas, 02-N20-C2H4, 5 yoke, 1 drawer	1215.00
103530	Quantiflex R.F., 3 gas, 02-N20-C3H6, 5 yoke, 3 drawer	1210.00
103531	Quantiflex R.F., 3 gas, 02-N20-Air, 5 yoke, 3 drawer	1300.00
103532	Quantiflex R.F., 3 gas, 02-N20-He, 5 yoke, 3 drawer	1300.00
103533	Quantiflex R.F., 3 gas, 02-N20-C02, 5 yoke, 3 drawer	1300.00
103534	Quantiflex R.F., 3 gas, 02-N20-C2H4, 5 yoke, 3 drawer	1300.00
103310	Quantiflex R.F., 3 gas, 02-N20-C3H6, 3 yoke, 1 drawer	1300.00
103311	Quantiflex R.F., 3 gas, 02-N20-Air, 3 yoke, 1 drawer	1165.00
103312	Quantiflex R.F., 3 gas, 02-N20-He, 3 yoke, 1 drawer	1165.00

EX-1486

QUANTIFLEX RIGID FRAME

STOCK NO.	DESCRIPTION	PRICE
103313	Quantiflex R.F., 3 gas, 02-N20-C02. 3 yoke, 1 drawer	$1165.00
103314	Quantiflex R.F., 3 gas, 02-N20-C2H4, 3 yoke, 1 drawer	1165.00
103330	Quantiflex R.F., 3 gas, 02-N20-C3H6, 3 yoke, 3 drawer	1155.00
103331	Quantiflex R.F., 3 gas, 02-N20-Air, 3 yoke, 3 drawer	1245.00
103332	Quantiflex R.F., 3 gas, 02-N20-He, 3 yoke, 3 drawer	1245.00
103333	Quantiflex R.F., 3 gas, 02-N20-CO2, 3 yoke, 3 drawer	1245.00
103334	Quantiflex R.F., 3 gas, 02-N20-C2H4, 3 yoke, 3 drawer	1245.00
104611	Quantiflex R.F., 4 gas, 02-N20-C3H6-Air, 6 yoke, 1 drawer	1305.00
104612	Quantiflex R.F., 4 gas, 02-N20-C3H6-He, 6 yoke, 1 drawer	1305.00
104613	Quantiflex R.F., 4 gas, 02-N20-C3H6-C02, 6 yoke, 1 drawer	1305.00
104614	Quantiflex R.F., 4 gas, 02-N20-C3H6-C2H4, 6 yoke, 1 drawer	1305.00
104631	Quantiflex R.F., 4 gas, 02-N20-C3H6-Air, 6 yoke, 3 drawer	1385.00
104632	Quantiflex R.F., 4 gas, 02-N20-C3H6-He 6 yoke, 3 drawer	1385.00
104633	Quantiflex R.F., 4 gas, 02-N20-C3H6-C02, 6 yoke, 3 drawer	1385.00
104634	Quantiflex R.F., 4 gas, 02-N20-C3H6-C2H4, 6 yoke, 3 drawer	1385.00
104411	Quantiflex R.F., 4 gas, 02-N20-C3H6-Air, 4 yoke, 1 drawer	1250.00

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C4-146-D

QUANTIFLEX RIGID FRAME

STOCK NO.	DESCRIPTION	PRICE
104412	Quantiflex R.F., 4 gas, 02-N20-C3H6-He, 4 yoke, 1 drawer	$1250.00
104413	Quantiflex R.F., 4 gas, 02-N20-C3H6-C02, 4 yoke, 1 drawer	1250.00
104414	Quantiflex R.F., 4 gas, 02-N20-C3H6-C2H4, 4 yoke, 1 drawer	1250.00
104431	Quantiflex R.F., 4 gas, 02-N20-C3H6-Air, 4 yoke, 3 drawer	1335.00
104432	Quantiflex R.F., 4 gas, 02-N20-C3H6-He, 4 yoke, 3 drawer	1335.00
104433	Quantiflex R.F., 4 gas, 02-N20-C3H6-C02, 4 yoke, 3 drawer	1335.00
104434	Quantiflex R.F., 4 gas, 02-N20-C3H6-C2H4, 4 yoke, 3 drawer	1335.00

All the models above include: table size 20"W x 18"D, 2 flowmeter tubes 10:1 ratio, 1 fine, 1 coarse for each gas; oxygen fail-safe system; two-stage regulator for each H.P. gas; open circuit system; DISS fittings for 02-N20; swivel-gate yokes; absorber mounting arm; conductive baked enamel finish.

QUANTIFLEX RIGID FRAME / MDM MIXER

100025	Quantiflex R.F., MDM Mixer, 2 Yoke, 1 Drawer	1210.00
100026	Quantiflex R.F., MDM Mixer, 2 Yoke, 3 Drawer	1290.00
100027	Quantiflex R.F., MDM Mixer, 4 Yoke, 1 Drawer	1265.00
100028	Quantiflex R.F., MDM Mixer, 4 Yoke, 3 Drawer	1345.00

Ex-145-B

JUNO MARK II

STOCK NO.	DESCRIPTION	PRICE
100000	Juno Mark II stand mounted, includes: Juno Mark II, adjustable stand, 1 yoke each for 02 and N20, w/36" hose assemblies, singl-use non-rebreathing valve, 36" corrugated breathing tube	$1000.00
100001	Juno Mark II stand mounted w/AE Pentec, includes same as (100000)	1300.00
305016	Mounting block for Juno Mark II and AE vaporizer	27.00
310001	Juno Mark II	625.00

RIGID FRAME ACCESSORIES

105000	Ventilator Power Outlet	26.00
317017	Baumanometer; Mercury Blood Pressure Manometer	80.00
105001	Mounting Bracket, Baumanometer-Rigid Frame	12.50
317015	Sphygmomanometer, Aneroid B-P Manometer	80.00
105002	Mounting Bracket, Sphygmomanometer-Rigid Frame	10.75
105003	Monitor Shelf	80.00
105005	Extended Mounting Arms (Set)	15.00
105006	Non-Rebreathing Bag Mount	35.00

FS MODEL ABSORBERS

300501	Model FS-68 Absorber, single canister with dome-type directional valves	330.00
300502	Model FS-68 Absorber, double canister with dome-type directional valves	350.00

FS MODEL ABSORBERS

STOCK NO.	DESCRIPTION	PRICE
300503	Model FS-68 Absorber, single canister without dome type directional valves	$ 289.00
300504	Model FS-68 Absorber, double canister without dome-type directional valves	309.00
300509	FS-68 Absorber, single canister, with dome-type directional valves, including: 2-36" breathing tubes, 1-3.5 liter square breathing bag, 1-size 4 mask, 1-size 5 mask, 1-adult head harness, FS Inhaler "Y"	385.25
300510	FS-68 Absorber, double canister with dome-type directional valves including: rubber accessories, same as above	405.25
300511	FS-68 Absorber, single canister without dome-type directional valves including: 2-36" breathing tubes, 1-3.5 liter square breathing bag, 1-size 4 mask, 1-size 5 mask, 1-adult head harness, FS Inhaler "Y"	344.25
300512	FS-68 Absorber, double canister without dome-type directional valves including: rubber accessories, same as above	364.25

ABSORBER ACCESSORIES

111001	Volumeter	275.00
305047	Adapter, Volumeter to FS-68 Absorber	12.00

ABSORBER ACCESSORIES

STOCK NO.	DESCRIPTION	PRICE
317029	Sphygmomanometer and 8-Day Clock Combination	$ 110.00
105004	Mounting Bracket, 317029 to FS-68 Absorber	12.50
305023	Conversion Kit, FS-68 Double Canister to Baralyme Prepack	5.00
305024	Conversion Kit, FS-65 and Ohio 20 and 21 to Baralyme Prepack	10.50
317008	Ohio #8 Ether Vaporizer	125.00
305066	Mounting Bracket, Ohio #8 to FS-68 Absorber	24.50
305045	Adapter, Volumeter to FS-65 and Ohio 20 and 21	20.00
305046	Adapter, Volumeter to Foregger Jumbo Absorber	25.00
315083	Pressure Manometer	22.00
305065	Pressure Relief Valve for FS-68 Absorber	22.50
305026	Mounting Arm, FS-68 Absorber to Quantiflex	17.50
315085	Inhaler "Y", Neoprene, Angle	8.50
315087	Inhaler "Y", Neoprene W/Pop-Off, Angle	15.00
315088	Inhaler "Y", Neoprene, Straight	10.00
315089	Inhaler "Y", Neoprene, W/Pop-Off, Straight	17.50
315090	Mask, Elbow, Adapter 15MM - 22MM (Hank's)	7.50
105034	Gas Evacuator System, F.S.	45.00
105035	Gas Evacuator System, Ohio	45.00
105036	Gas Evacuator System, Foregger	45.00
105030	Housing, Pressure Relief Valve, F.S.	20.00
105031	Housing, Pressure Relief Valve, Ohio	20.00

STOCK NO.	DESCRIPTION	PRICE
ABSORBER ACCESSORIES		
105032	Housing, Pressure Relief Valve, Foregger	20.00
105033	Flow Reducer, F.S., Ohio, Foregger	26.00
315082	Dupaco Non-Rebreathing Valve	22.00
315084	Steen Pressure Equalizing Valve	35.00
CONDUCTIFLEX RUBBER GOODS		
316000	Conductiflex Face Mask, Small Infant, Size 0	8.50
316001	Conductiflex Face Mask, Infant, Size 1	8.50
316002	Conductiflex Face Mask, Child, Size 2	8.50
316003	Conductiflex Face Mask, Small Adult, Size 3	8.50
316004	Conductiflex Face Mask, Medium Adult, Size 4	8.50
316005	Conductiflex Face Mask, Large Adult, Size 5	8.50
316006	Conductiflex Face Mask, Extra Large Adult, Size 6	8.50
316007	Conductive Head Harness	4.50
316018	Conductiflex Breathing Tube, 7/8" Insert, 12" Long	5.00
316020	36" Corrugated Breathing Tube, 7/8" Insert	7.00
316041	Conductiflex Breathing Bag, Oval, 1 Liter	4.25
316042	Conductiflex Breathing Bag, Oval, 2 Liter	4.50
316043	Conductiflex Breathing Bag, Oval, 3 Liter	4.75
316045	Conductiflex Breathing Bag, Oval, 5 Liter	5.25

CONDUCTIFLEX RUBBER GOODS

STOCK NO.	DESCRIPTION	PRICE
316035	Conductiflex Breathing Bag, Square, 3.5 Liter	$ 4.75
316050	Conductiflex Breathing Bag, Square, 5 Liter	5.25

VAPORIZERS

300000	Fluotec Mark III 0.5% - 5.0% @1/2% Intervals	320.00
300001	Fluotec Mark III 0.5% - 5.0% @1/2% Intervals, P/S	380.00
300002	Fluotec Mark II 0.5%- 3.0% @1/10% Intervals	300.00
300003	Fluotec Mark II 0.5% - 3.0% @1/10% Intervals, P/S	360.00
300004	Fluotec Mark II 0.5% - 4.0% @1/2% Intervals	300.00
300005	Fluotec Mark II 0.5% - 4.0% @1/2% Intervals, P/S	360.00
300006	Tritec 0.5% - 1.5% @1/10% Intervals	300.00
300007	Tritec 0.5% - 1.5% @1/10% Intervals, P/S	360.00
300008	Chlorotec 0.5% - 5.0% @1/2% Intervals	300.00
300009	Chlorotec 0.5% - 4.0% @1/2% Intervals, P/S	360.00
300010	Fluotec MJ 1.0% - 10.0% @1% Intervals	300.00
300011	Fluotec MJ 1.0% - 10.0% @1% Intervals, P/S	360.00
300012	Fluoromartec 1.0% - 8.0% @1% Intervals	300.00
300013	Fluoromartec 1.0% - 8.0% @1% Intervals, P/S	360.00
300014	Azeotec 0.5% - 4.5% @1/2% Intervals	300.00
300016	Pentec Mark II 0.35% - 2.0% @1/2% Intervals	320.00
300017	Pentec Mark II 0.35% - 2.0% @1/2% Intervals, P/S	380.00

VAPORIZERS

STOCK NO.	DESCRIPTION	PRICE
300018	Pentec Mark I 0.5% - 1.5% 01/10% Intervals	$ 300.00
300019	Pentec Mark I 0.5% - 1.5% 01/10% Intervals P/S	360.00
300020	AE Fluotec 0.5% - 3.0%	300.00
300021	AE Fluotec 0.5% - 3.0%, P/S	360.00
300022	AE Fluotec 0.5% - 5.0%	300.00
300023	AE Fluotec 0.5% - 5.0%, P/S	360.00
300024	AE Pentec 0.1% - 1.0%	300.00
300025	AE Pentec 0.1% - 1.0%, P/S	360.00
300034	Ethertec	320.00
300026	Cyprane Inhaler for Penthrane, complete with wrist strap, measuring cup and mask	85.00
300028	Cyprane Inhaler for Penthrane, complete with wrist strap, measuring cup and mask	85.00
300030	Cyprane Inhaler for Trilene, complete with wrist strap, measuring cup and mask	85.00
300040	Cyprane Inhaler Kit for Penthrane: Cyprane Inhaler W/P.S., 10 NRB Valves, wrist strap, bedrail clamp, 36" tube, face mask	165.00
300046	Concentrator Vaporizer	390.00
317008	Ohio #8 Vaporizer	125.00
317010	Ohio #10 Vaporizer	105.00
317012	B.O.C. Ether Vaporizer	80.00
317013	B.O.C. Trilene Vaporizer	80.00

VAPORIZER ACCESSORIES

317007	Wick for Ohio #8 Vaporizer	20.00
317009	Bottle for Ohio #8 Vaporizer	8.75

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VAPORIZER ACCESSORIES

STOCK NO.	DESCRIPTION	PRICE
317011	Bottle for Ohio #10 Vaporizer	$ 6.75
317026	Bottle for B.O.C. Ether Vaporizer	1.75
317027	Bottle for B.O.C. Trilene Vaporizer	1.75
305001	Fluotec Mk II and Pentec Mk I Cleaning Kit	15.00
305063	Pentec Pin Safety Bottle Adapter	9.00
305064	Fluotec Pin Safety Bottle Adapter	9.00
305060	Singl-use NRB Valve	1.00

VAPORIZER BRACKETS

305070	A-15 Tubing Adapter	9.00
305071	FS-1 Two-Way Directional Valve	42.00
305072	FS-2A Inlet Tubing Adapter	6.00
305073	FS-2 Outlet Tubing Adapter	6.00
305074	FS-3 T.I.B. Adapter	9.50
305075	FS-4 Bag Adapter - Straight	12.00
305076	FS-4C Bag Adapter - Curved	12.00
305077	FS-6 Vaporizer Mount for Ohio Model #3333	20.00
305078	FSG-8-9 Greifenstein Bracket	54.50
305079	FS-20 Side Arm Bracket	40.00
305080	FS-21 Universal Head (for Fluotec Mark II and Pentec Mark I)	18.00
305081	FS-23 Table Clamp	43.00
305082	FS-24 Horizontal Twin Vaporizer Bar	10.00
305083	FS-25 Vertical Twin Vaporizer	13.00

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VAPORIZER BRACKETS

STOCK NO.	DESCRIPTION	PRICE
305084	FS-27 Post Mount for Ohio #3333	$ 17.25
305085	FS-31 Spacer to Mount Fluotec Mk II and Pentec Mk I to Ohio Unitrol	5.00
305086	FS-40 Universal Bracket (for Fluotec Mk III and Pentec Mk II)	7.00
305087	FS-41 Conductive Rubber Base	15.00
305088	FS-43 Bracket	6.00
305089	Type 1 Bracket, Table Mount	33.00
305092	Type 4 Bracket, Post Mount	22.50
305093	FS-44 Mounting Kit Fluotec Mk III - Pentec Mk II to Rigid Frame - Boyle	8.50
305094	FS-45 Mounting Kit - Fluotec Mk III - Pentec Mk II to Ohio Unitrol Machine	8.50
317024	Adapter, AE Vaporizer to McKesson Narmatic	20.00
315075	Conductive Rubber Tubing 1/4 x 1/16	.55/ft.
315076	Conductive Rubber Tubing 5/16 x 3/32	.60/ft.

LARYNGOSCOPES

STOCK NO.	DESCRIPTION	PRICE
315150	LARYNGOSCOPE STANDARD HOOK-ON HANDLE WITH SPARE LAMP	$ 14.50
315151	LARYNGOSCOPE MACINTOSH LARGE, ADULT #4, 158MM	24.00
315152	LARYNGOSCOPE MACINTOSH MEDIUM, ADULT #3, 130MM	24.00
315153	LARYNGOSCOPE MACINTOSH CHILD, #2, 108MM	24.00
315154	LARYNGOSCOPE MACINTOSH INFANT, #1, 100MM	24.00
315155	LARYNGOSCOPE GUEDEL LARGE, ADULT #4, 195MM	24.00
315156	LARYNGOSCOPE GUEDEL MEDIUM, ADULT #3, 175MM	24.00
315157	LARYNGOSCOPE GUEDEL CHILD, #2, 125MM	24.00
315158	LARYNGOSCOPE WIS-FOREGGER LARGE, ADULT #4, 210MM	24.00
315159	LARYNGOSCOPE WIS-FOREGGER MEDIUM, ADULT #3, 162MM	24.00
315160	LARYNGOSCOPE WIS-FOREGGER CHILD, #2, 135MM	24.00
315161	LARYNGOSCOPE WIS-FOREGGER INFANT, #1	24.00
315162	LARYNGOSCOPE MILLER INFANT, #1, 102MM	24.00
315163	LARYNGOSCOPE MILLER PREMATURE, #0, 75MM	24.00
315164	LARYNGOSCOPE LAMP, LARGE FOR MACINTOSH, GUEDEL, WIS-FOREGGER	1.85
315165	LARYNGOSCOPE LAMP, SMALL FOR MILLER	1.85
315166	LARYNGOSCOPE BATTERY SIZE "C"	.60

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ENDOTRACHEAL TUBES

STOCK NO.	DESCRIPTION	PRICE
316162	MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11.0MM	$ 3.00
316170	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5MM	3.00
316171	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5.5MM	3.00
316172	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.0MM	3.00
316173	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.5MM	3.00
316174	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.0MM	3.00
316175	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.5MM	3.00
316176	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.0MM	3.00
316177	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.5MM	3.00
316178	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.0MM	3.00
316179	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.5MM	3.00
316180	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 10.0MM	3.00
316182	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11.0MM	3.00

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ENDOTRACHEAL TUBES

STOCK NO.	DESCRIPTION	LIST
316162	MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11.0MM	$ 3.00
316170	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5MM	3.00
316171	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5.5MM	3.00
316172	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.0MM	3.00
316173	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.5MM	3.00
316174	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.0MM	3.00
316175	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.5MM	3.00
316176	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.0MM	3.00
316177	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.5MM	3.00
316178	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.0MM	3.00
316179	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.5MM	3.00
316180	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 10.0MM	3.00
316182	MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11.0MM	3.00

ENDOTRACHEAL TUBES

STOCK NO.	DESCRIPTION	LIST
316210	COLE TUBE, P.V.C., 8F	$ 2.00
316211	COLE TUBE, P.V.C., 10F	2.00
316212	COLE TUBE, P.V.C., 12F	2.00
316213	COLE TUBE, P.V.C., 14F	2.00
316214	COLE TUBE, P.V.C., 16F	2.00
316215	COLE TUBE, P.V.C., 18F	2.00
316220	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 5.0MM	3.25
316221	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 5.5MM	3.25
316222	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 6.0MM	3.25
316223	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 6.5MM	3.25
316224	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 7.0MM	3.25
316225	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 7.5MM	3.25
316226	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 8.0MM	3.25
316227	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 8.5MM	3.25
316228	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 9.0MM	3.25
316229	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 9.5MM	3.25
316230	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 10.0MM	3.25

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ENDOTRACHEAL TUBES

STOCK NO.	DESCRIPTION	LIST
316232	MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 11.0MM.	$ 3.25
316240	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 5.0MM	3.50
316241	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 5.5MM	3.50
316242	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 6.0MM	3.50
316243	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 6.5MM	3.50
316244	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 7.0MM	3.50
316245	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 7.5MM	3.50
316246	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 8.0MM	3.50
316247	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 8.5MM	3.50
316248	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 9.0MM	3.50
316249	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 9.5MM	3.50

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ENDOTRACHEAL TUBES

STOCK NO.	DESCRIPTION	LIST
316250	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 10.0MM	$ 3.25
316252	MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 11.0MM	3.25
316260	MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 2.5MM	1.00
316261	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 3.0MM	1.00
316262	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 3.5MM	1.00
316263	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 4.0MM	1.00
316264	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 4.5MM	1.00
316265	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 5.0MM	1.00
316266	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 5.5MM	1.00
316267	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 6.0MM	1.00
316268	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 6.5MM	1.00
316269	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 7.0MM	1.00
316270	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 7.5MM	1.00

ENDOTRACHEAL TUBES

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STOCK NO.	DESCRIPTION	LIST
316271	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 8.0MM	$ 1.00
316272	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 8.5MM	1.00
316273	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 9.0MM	1.00
316274	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 9.5MM	1.00
316275	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 10.0MM	1.00
316277	MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 11.0MM	1.00

ENDOTRACHEAL TUBE CONNECTORS

815030	CANINE ENDOTRACHEAL TUBE ADAPTER 12MM	5.00
815031	CANINE ENDOTRACHEAL TUBE ADAPTER 15MM	5.00
815032	CANINE ENDOTRACHEAL TUBE ADAPTER 20MM	5.00
315000	ENDOTRACHEAL TUBE CONNECTOR S.S. 2.0MM	2.00
315002	ENDOTRACHEAL TUBE CONNECTOR S.S. 3.0MM	2.00
315004	ENDOTRACHEAL TUBE CONNECTOR S.S. 4.0MM	2.00
315006	ENDOTRACHEAL TUBE CONNECTOR S.S. 5.0MM	2.00
315008	ENDOTRACHEAL TUBE CONNECTOR S.S. 6.0MM	2.00
315010	ENDOTRACHEAL TUBE CONNECTOR S.S. 7.0MM	2.00
315012	ENDOTRACHEAL TUBE CONNECTOR S.S. 8.0MM	2.00
315014	ENDOTRACHEAL TUBE CONNECTOR S.S. 9.0MM	2.00
315016	ENDOTRACHEAL TUBE CONNECTOR S.S. 10.0MM	2.00
315018	ENDOTRACHEAL TUBE CONNECTOR S.S. 11.0MM	2.00
315020	ENDOTRACHEAL TUBE CONNECTOR S.S. 12.0MM	2.00

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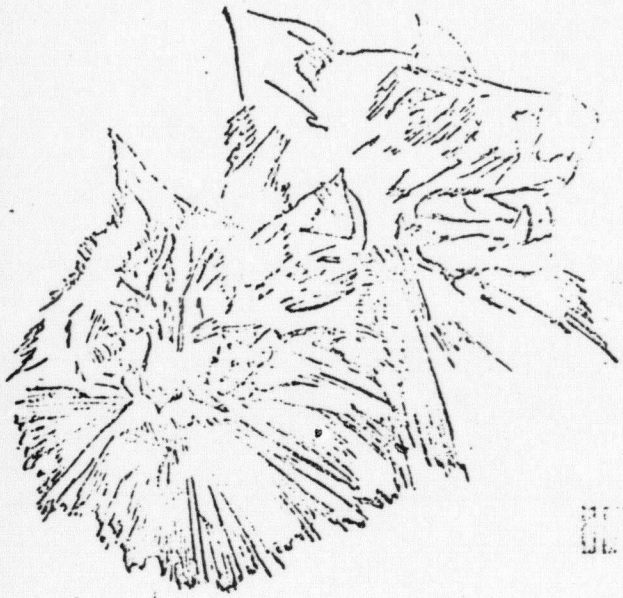
EX-147-A

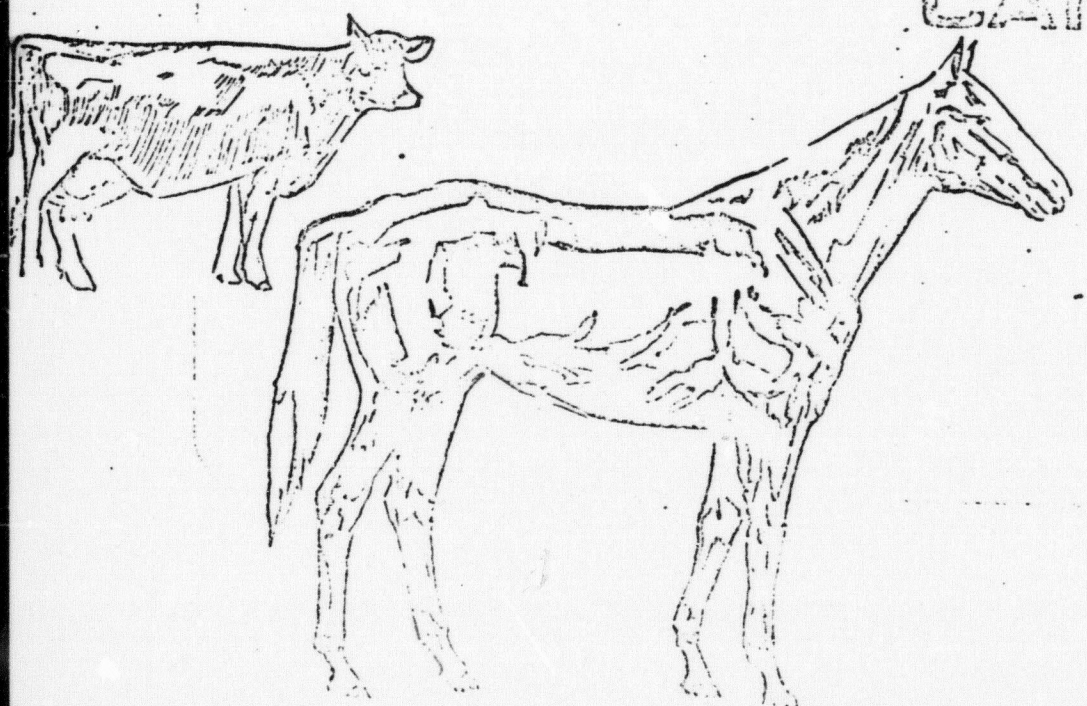


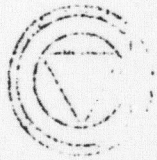
FRASER SWEDESMAN

INCORPORATED

VETERINARY

ANESTHESIA EQUIPMENT CATALOG





Fraser Swedesman Incorporated

FRASER SWEATMAN INCORPORATED

A 4434

CX-147-B

VMS

SMALL ANIMAL ANESTHESIA MACHINE

800001 VMS-1 INCLUDES: FLUOTEC MARK III WITH MOUNTING BRACKET, CO2 ABSORBER, INHALATION AND EXHALATION VALVES, POP-OFF VALVE, O2 FLOWMETER, DISS CONNECTION, FLUSH VALVE ASSEMBLY, PRESSURE MANOMETER, FS-2 OUTLET ADAPTER, FS-2A INLET ADAPTER, TWO 36" BREATHING TUBES, REBREATHING BAG, INHALER "Y," ADJUSTABLE MOUNT AND STAND.

800002 VMS-2 INCLUDES: #8 VAPORIZER WITH MOUNTING BRACKET AND SAME AS VMS-1 (800001) LESS FLUOTEC, BRACKETS, FS-2 AND FS-2A.

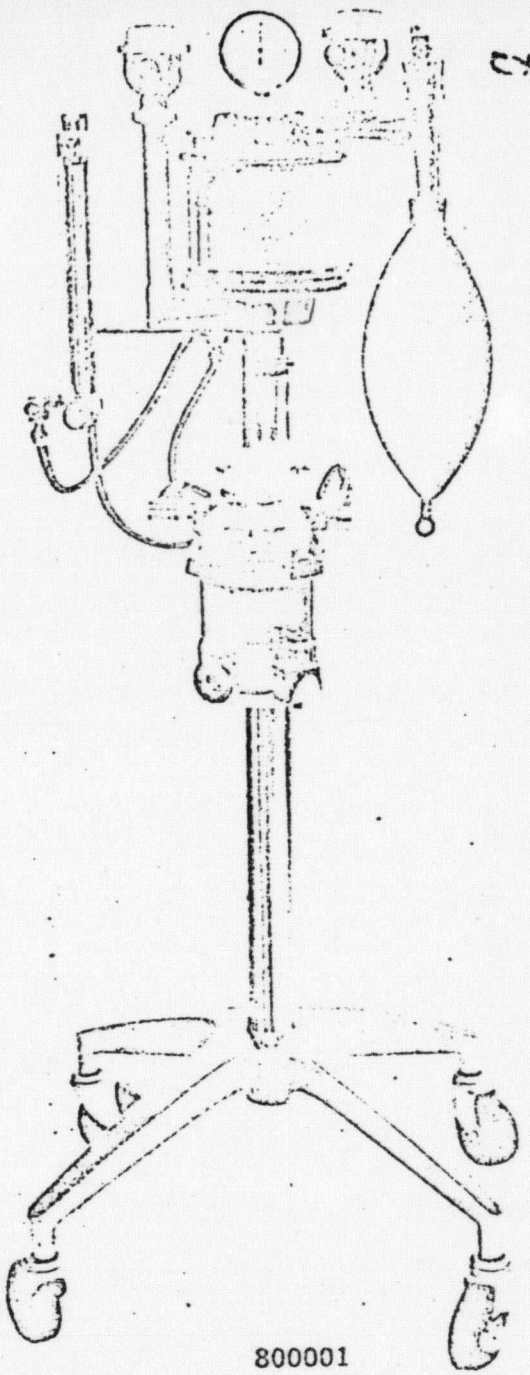
800003 VMS-3 INCLUDES: SAME AS VMS-1 (800001) LESS VAPORIZER.

800004 VMS-4 INCLUDES: SAME AS VMS-1 (800001) LESS VAPORIZER, BRACKETS AND RUBBER GOODS.

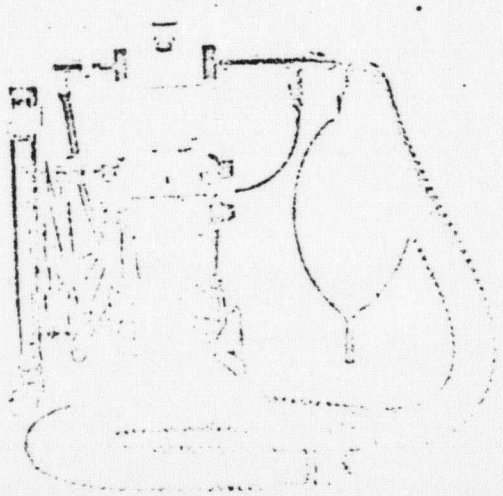
800005 VMS-5 INCLUDES: PENTEC MARK II AND SAME AS VMS-1 (800001)—LESS FLUOTEC MARK III.

800010 ANALAB-1 TABLE MODEL NON BREATHING ANESTHESIA MACHINE INCLUDING: FLUOTEC MARK III, O2 FLOWMETER WITH FLUSH VALVE, PRESSURE RELIEF VALVE, REBREATHING BAG, CORRUGATED BREATHING TUBE, NON-REBREATHING VALVE, FS-2 OUTLET AND FS-2A INLET ADAPTERS, RUBBER BASE FOR TABLE.

800011 ANALAB-2 TABLE MODEL NON-REBREATHING ANESTHESIA MACHINE INCLUDING: PENTEC MARK II AND SAME AS ANALAB-1 LESS FLUOTEC MARK III.



800001



800010

A 4435 FRASER SWEATMAN INCORPORATED

VMS ANESTHESIA APPARATUS

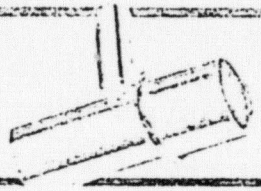
CX-147-C

o305020 REPLACEMENT CO2 CANISTER FOR VMS

315107 PARALYME CARTON (24 PER CASE)
805004 VMS 02 FLOWMETER ASSEMBLY 200 CC—5 LITERS

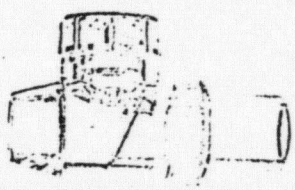
805005 VMS N20 FLOWMETER ASSEMBLY 200 CC—4.5 LITERS
805006 VMS 02-N20 FLOWMETER COMBINATION ASSEMBLY

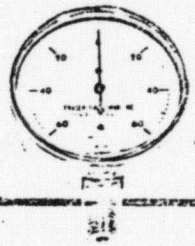
805010 VMS PORTABLE STAND
305035 PRESSURE RELIEF VALVE
305042 02 FLUSH ASSEMBLY



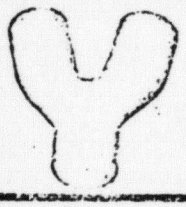
o 315080 AYRES T-TUBE, METAL

315082 DUPACO NON-REBREATHING VALVE o





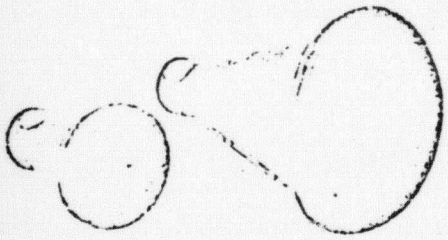
o 315083 PRESSURE MANOMETER

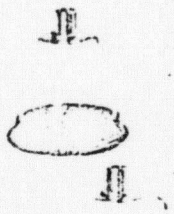


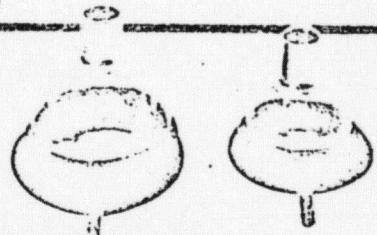
o315088 INHALER—Y NEOPRENE
315089 INHALER—Y NEOPRENE WITH POP-OFF

315086 TAPERED ADAPTER FOR NON-REBREATHING SYSTEM

315090 MASK ELBOW ADAPTER 15MM-22MM (HANK'S)
315091 MASK ADAPTER STRAIGHT 15MM-22MM
815020 MASK ADAPTER STRAIGHT NCG





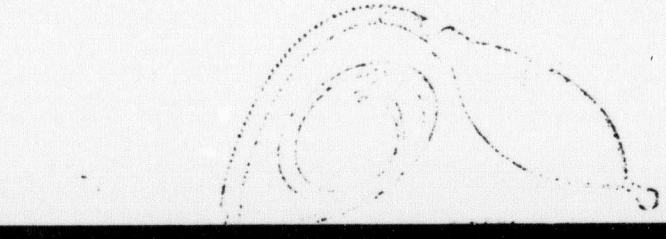


o805027 CAT MASK, SMALL
o805028 CAT MASK, MEDIUM
o805029 CAT MASK, LARGE
815009 CAT MASK HEAD HARNESS

815014 DIAPHRAGM, CAT MASK, SMALL
815015 DIAPHRAGM, CAT MASK, MEDIUM
815016 DIAPHRAGM, CAT MASK, LARGE

315093 CUFF SPREADER
315094 CLEANING BRUSH 4MM
315096 CLEANING BRUSH 6MM
315098 CLEANING BRUSH 8MM
315100 CLEANING BRUSH 10MM
317007 REPLACEMENT WICK FOR OHIO #8 VAPORIZER
317009 REPLACEMENT BOTTLE FOR OHIO #3 VAPORIZER

o815022 CANINE MASK, RUBBER, SMALL
o815024 CANINE MASK, LARGE, RUBBER
815026 CANINE MASK, SMALL, o
PLASTIC W/DIAPHRAGM
815028 CANINE MASK, LARGE, o
PLASTIC W/DIAPHRAGM
[illegible] CANINE MASK, SMALL
[illegible] CANINE MASK, LARGE
[illegible] E.R. ENDOTRACHEAL TUBE WITH CUFF

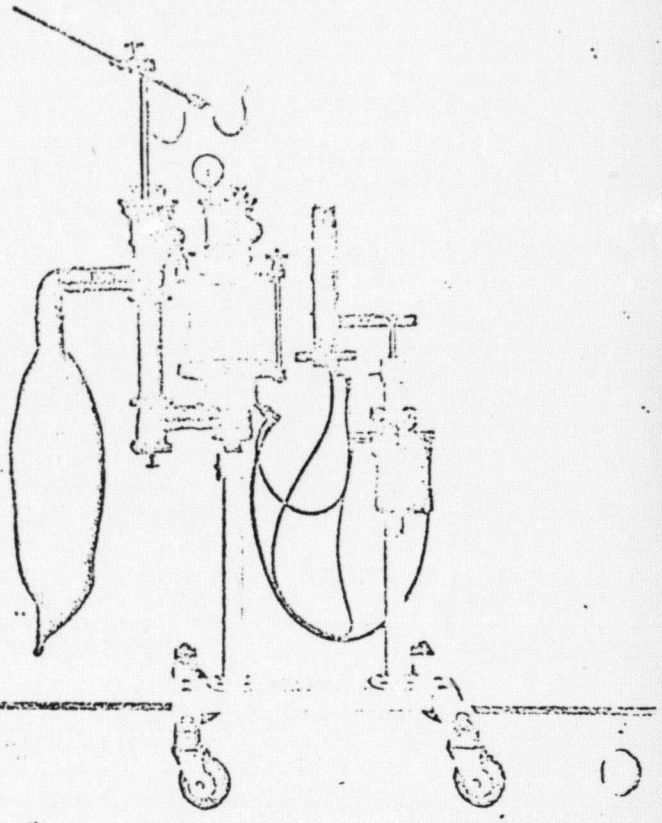


A 4436

CX-147-D

VML

LARGE ANIMAL ANESTHESIA MACHINE

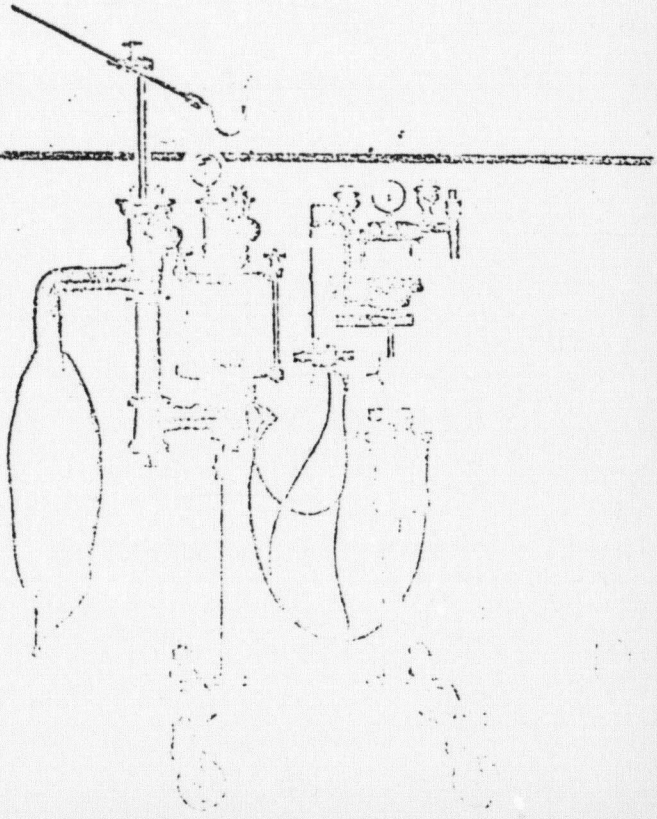


o802001 VML-1 INCLUDES: FLUOTEC MARK III CO2 ABSORBER, DIRECTIONAL VALVES, FLOW-METER (10L) WITH FLUSH VALVE ASSEMBLY, PRESSURE MANOMETER POP-OFF VALVE, REBREATHING BAG (30L), FS-2A INLET ADAPTER, FS-2 OUTLET ADAPTER, VAPORIZER MOUNTING BRACKET, TWO (2) 2" DIAMETER BREATHING TUBES, INHALER "Y" PIECE, BREATHING TUBE SUPPORT ARM, THREE (3) ENDOTRACHEAL TUBE CONNECTORS, ADJUSTABLE MOUNT AND STAND.

802002 VML-2 WITH PENTEC MARK II, INCLUDES ALL COMPONENTS LISTED UNDER 802001, BUT LESS FLUOTEC MARK III.

802003 VML-3 WITH FLUOTEC MJ 10% INCLUDES ALL COMPONENTS LISTED UNDER 802001, BUT LESS FLUOTEC MARK III.

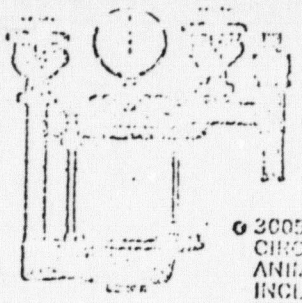
802004 VML-4 LESS VAPORIZER AND BRACKET, BUT INCLUDES ALL COMPONENTS LISTED UNDER 802001.



o802005 VML-5 WITH SMALL ANIMAL BREATHING CIRCUIT, INCLUDES ALL COMPONENTS LISTED UNDER 802001.

A 4437 VML

ANESTHESIA ACCESSORIES

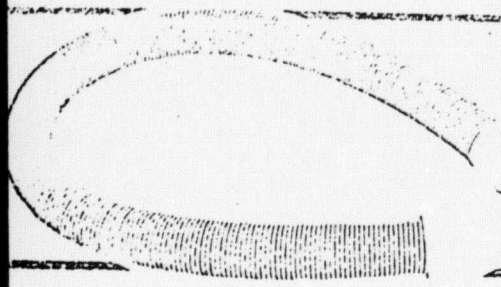


○ 300513 SMALL ANIMAL BREATHING CIRCUIT FOR LARGE ANIMAL ANESTHESIA MACHINE INCLUDING CO2 ABSORBER, FLOWMETER MOUNT, DIRECTIONAL VALVES, POP-OFF VALVE, PRESSURE MANOMETER, FS-2 OUTLET ADAPTER, FS-2A INLET ADAPTER, REBREATHING BAG, INHALER "Y," TWO (2) 36" BREATHING TUBES, ROD FOR MOUNTING ON VML.

CX-147-E

815400 REBREATHING BAG, 2" OUTLET (30L)

815401 REBREATHING BAG, 2" OUTLET (15L)



○ 815402 BREATHING TUBE 2" DIAMETER FOR VML W/ADAPTERS

○ 815403 INHALER "Y" VML

805400 VML FLOWMETER ASSEMBLY 02, 1-10L

805401 VML FLOWMETER ASSEMBLY N20, 1-10L

805402 VML FLOWMETER ASSEMBLY FOR 02 AND N20, 1-10L

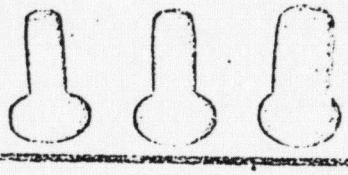
805410 REPLACEMENT CO2 CANISTER VML

○ 805411 BREATHING TUBE SUPPORT ARM ASSEMBLY

805413 VISIBLE MOISTURE TRAP VML

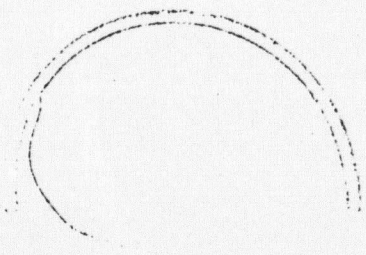
805414 FLOWMETER MOUNTING ARM FOR VML W/NUT

805415 02 FLUSH VALVE ASSEMBLY VML



805421 ENDOTRACHEAL TUBE CONNECTOR 21MM
805425 ENDOTRACHEAL TUBE CONNECTOR 25MM
805434 ENDOTRACHEAL TUBE CONNECTOR 34MM

○ 815412 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 20MM W/CUFF
815414 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 24MM W/CUFF
815416 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 26 MM W/CUFF
815418 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 28MM W/CUFF
815420 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 30MM W/CUFF
815422 LARGE ANIMAL ENDOTRACHEAL TUBE STRAIGHT 125MM X 32MM W/CUFF



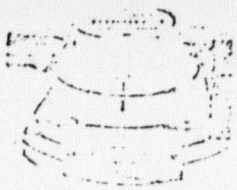
○ 815432 LARGE ANIMAL ENDOTRACHEAL TUBE CURVED W/CUFF I.D. 12MM
815440 LARGE ANIMAL ENDOTRACHEAL TUBE CURVED W/CUFF I.D. 20MM
815442 LARGE ANIMAL ENDOTRACHEAL TUBE CURVED W/CUFF I.D. 24MM
815444 LARGE ANIMAL ENDOTRACHEAL TUBE CURVED W/CUFF I.D. 26MM
815446 LARGE ANIMAL ENDOTRACHEAL TUBE CURVED W/CUFF I.D. 28MM

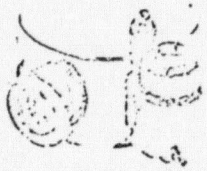
A 4438

CX-147-F

WALKER MUFFLERS

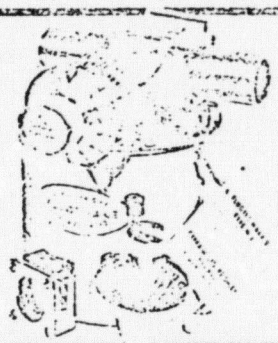
& BRACKETS





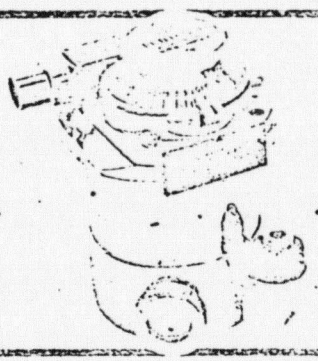
300000 FLUOTEC MARK III 0.5% TO 5.0% @½% INTERVALS

300001 FLUOTEC MARK III 0.5% TO 5.0% @½% INTERVALS WITH PIN SAFETY



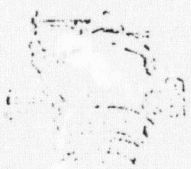
300010 FLUOTEC MJ 0.5% TO 10.0% @1% INTERVALS

300011 FLUOTEC MJ 0.5%TO 10.0% @1% INTERVALS WITH PIN SAFETY

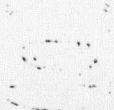


300016 PENTEC MARK II 0.35% TO 2.0% @½% INTERVALS

300017 PENTEC MARK II 0.35% TO 2.0% @½% INTERVALS WITH PIN SAFETY



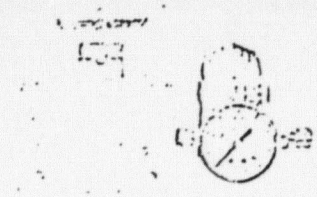
3179[illegible] FLO-[illegible] VALVEMEER FOR ETHER AND MILLIPORE FLAME

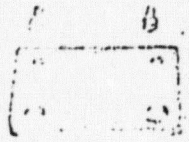


A 4439 ○REGULATORS
○HOSE
ASSEMBLIES

EX-147-G

BEST COPY AVAILABLE

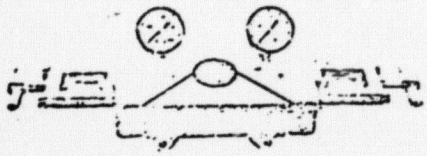




○305030 "E" CYLINDER, 02, SINGLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, AND FITTINGS

305031 "E" CYLINDER, 02, DOUBLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, CHECK VALVES, AND FITTINGS

305032 "E" CYLINDER, N20, SINGLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, AND FITTINGS



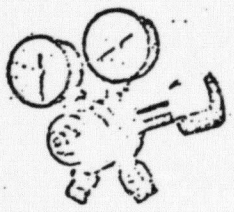
○305034 "E" CYLINDER, 02 & N20, DOUBLE YOKE TANK BRACKET: TWO (2) 36" HOSES DISS TO DISS, REGULATORS, GAUGES, AND FITTINGS

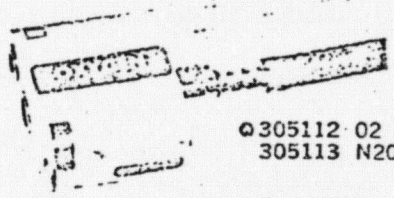
305035 "E" CYLINDER, 02 & N20, FOUR (4) YOKE TANK BRACKET: TWO (2) 36" HOSES, DISS TO DISS, REGULATORS, GAUGES, CHECK VALVES, AND FITTINGS

305100 YOKE REGULATOR, 02, SINGLE STAGE, LESS HOSE

305101 YOKE REGULATOR, N20, SINGLE STAGE, LESS HOSE

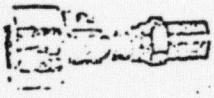
305108 02 MANIFOLD, INCLUDES: PIGTAIL & TEE
305109 N20 MANIFOLD, INCLUDES: PIGTAIL & TEE
305110 02 HOSE ASSEMBLY DISS/DISS
305111 N20 HOSE ASSEMBLY DISS/DISS





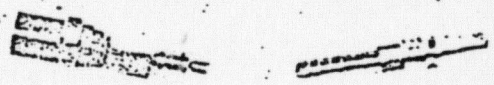
○305104 LARGE CYLINDER REGULATOR, 02, SINGLE STAGE, LESS HOSE
305105 LARGE CYLINDER REGULATOR, N20, SINGLE STAGE, LESS HOSE

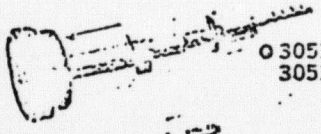
○305112 02 HOSE ASSEMBLY DISS/NCG FEMALE
305113 N20 HOSE ASSEMBLY DISS/NCG FEMALE



○305114 02 HOSE ASSEMBLY DISS/PURITAN FEMALE
305115 N20 HOSE ASSEMBLY DISS/PURITAN FEMALE

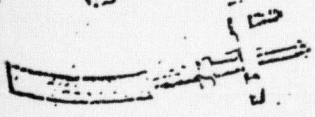
○305116 02 HOSE ASSEMBLY DISS/SCHRADER FEMALE
305117 N20 HOSE ASSEMBLY DISS/SCHRADER FEMALE





○305118 02 HOSE ASSEMBLY DISS/OHIO FEMALE
305119 N20 HOSE ASSEMBLY DISS/OHIO FEMALE

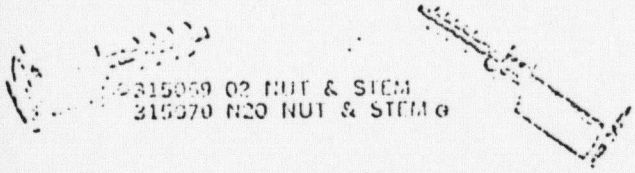
○
305122 02 HOSE ASSEMBLY DISS/PURITAN MALE
305123 N20 HOSE ASSEMBLY DISS/PURITAN MALE
305124 02 HOSE ASSEMBLY DISS/SCHRADER MALE
305125 N20 HOSE ASSEMBLY DISS/SCHRADER MALE



○305120 02 HOSE ASSEMBLY DISS/NCG MALE
305121 N20 HOSE ASSEMBLY DISS/NCG MALE

○305126 02 HOSE ASSEMBLY DISS/OHIO MALE
305127 N20 HOSE ASSEMBLY DISS/OHIO MALE

○305040 02 DISS MALE ⅛ NPT
305041 N20 MALE ⅛ NPT○



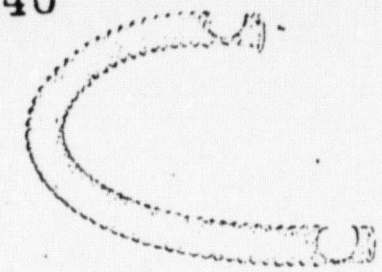
○315069 02 NUT & STEM
315070 N20 NUT & STEM ○

315071 02 HOSE
315072 N20 HOSE
○315073 FERRULE (TO SECURE HOSE FITTINGS)
315074 CYLINDER HAND WHEEL ("E" CYLINDER)
315075 BLACK RUBBER TUBING, CONDUCTIVE ¼" I.D.
315076 BLACK RUBBER TUBING, CONDUCTIVE ⅜" I.D.

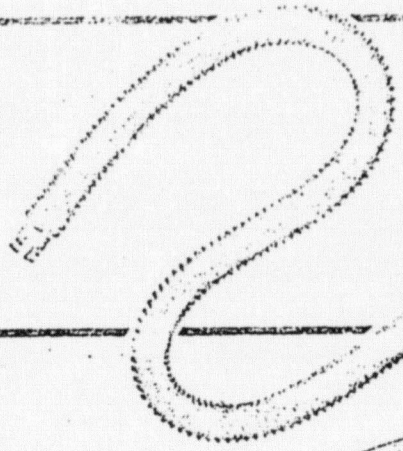
305130 QUICK CONNECT OUTLET STATION FOR 02, ONLY, EXPOSED
305131 QUICK CONNECT OUTLET STATION FOR N20, ONLY, EXPOSED

305133 QUICK CONNECT OUTLET STATION FOR 02, ONLY, CONCEALED
305134 QUICK CONNECT OUTLET STATION FOR N20, ONLY, CONCEALED

CX-147-H

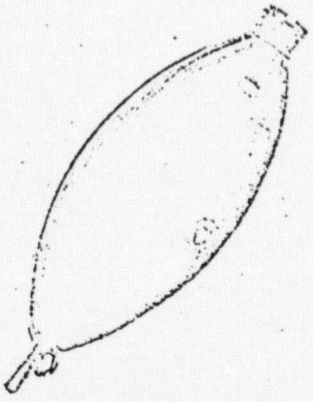


o316019 CONDUCTIVE BREATHING TUBE ½" INSERT
12" LONG



o316020 36" CONDUCTIFLEX BREATHING TUBE ⅞"
INSERT

316035 CONDUCTIFLEX SQUARE REBREATHING BAG
3.5 LITER
o316050 CONDUCTIFLEX SQUARE REBREATHING BAG
5 LITER



316041 CONDUCTIFLEX OVAL REBREATHING BAG
1 LITER
316042 CONDUCTIFLEX OVAL REBREATHING BAG
2 LITER
316043 CONDUCTIFLEX OVAL REBREATHING BAG
3 LITER
o316045 CONDUCTIFLEX OVAL REBREATHING BAG
5 LITER

316065 ESOPHAGEAL STETHOSCOPE, SMALL
316066 ESOPHAGEAL STETHOSCOPE, MEDIUM
316067 ESOPHAGEAL STETHOSCOPE, LARGE
o316068 ESOPHAGEAL SET, INCLUDING THREE
(3) E.S.I. STETHOSCOPES, ONE PER
MEDIUM PLASTIC PLEURS, ZIPPED CASE

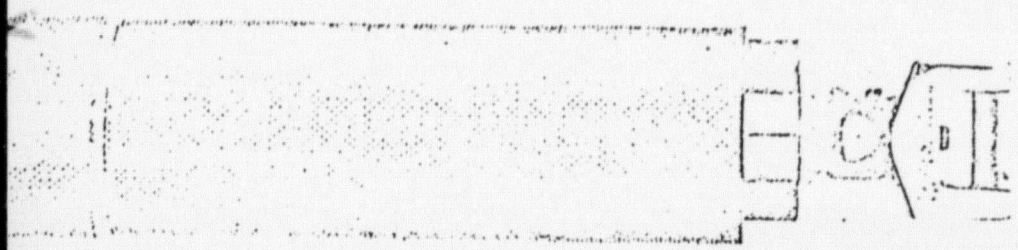
FRASER SWEATMAN, INCORPORATED

A 4441

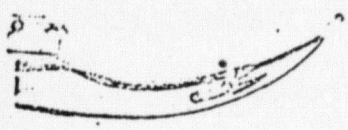
LARYNGOSCOPES

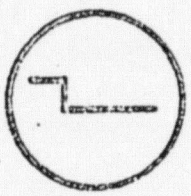
WITH STAINLESS STEEL HOOK-ON BLADES

CX-147-I



315150 LARYNGOSCOPE HANDLE STANDARD HOOK-ON WITH SPARE LAMP



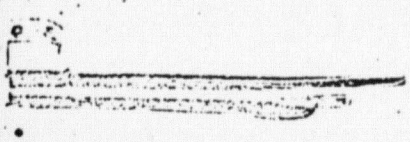


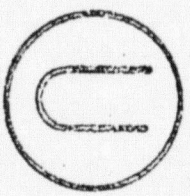
315151 LARYNGOSCOPE MACINTOSH LARGE, ADULT #4, 158MM

315152 LARYNGOSCOPE MACINTOSH MEDIUM, ADULT #3, 130MM

315153 LARYNGOSCOPE MACINTOSH CHILD, #2. 108MM.

315154 LARYNGOSCOPE MACINTOSH INFANT, #1, 100MM

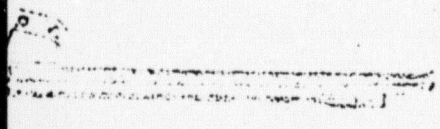


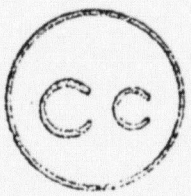


315155 LARYNGOSCOPE GUEDEL LARGE, ADULT #4, 195MM

315156 LARYNGOSCOPE GUEDEL MEDIUM, ADULT #3. 175MM

315157 LARYNGOSCOPE GUEDEL CHILD, #2, 125MM



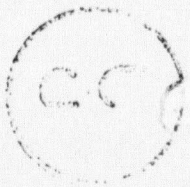


315158 LARYNGOSCOPE WIS-FOREGGER LARGE, ADULT #4, 210MM

315159 LARYNGOSCOPE WIS-FOREGGER MEDIUM, ADULT #3, 162MM

315160 LARYNGOSCOPE WIS-FOREGGER CHILD, #2, 135MM

315161 LARYNGOSCOPE WIS-FOREGGER INFANT, #1



315162 LARYNGOSCOPE MILLER INFANT, #1, 102MM

315163 LARYNGOSCOPE MILLER PREMATURE, #0, 75MM

315164 LARYNGOSCOPE LAMP, LARGE FOR MACINTOSH, GUEDEL, WIS-FOREGGER

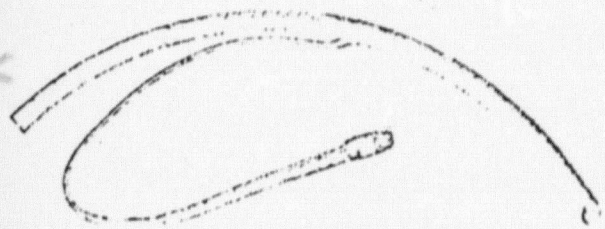
315165 LARYNGOSCOPE LAMP, SMALL FOR MILLER

315166 LARYNGOSCOPE BATTERY SIZE "C"

A 4442

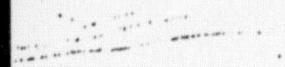
CX-147-J

TRACHEAL TUBES & CONNECTORS



316150 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5mm
316151 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5.5mm
316152 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6mm
316153 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.5mm
316154 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7mm
●316155 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.5mm
316156 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8mm
316157 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.5mm
316158 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9mm
316159 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.5mm
316160 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 10mm
316162 MAGILL R.R. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11mm

316170 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5.0mm
316171 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 5.5mm
316172 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.0mm
316173 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 6.5mm
316174 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.0mm
316175 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 7.5mm
316176 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.0mm
316177 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 8.5mm
316178 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.0mm
316179 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 9.5mm
316180 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 10.0mm
316182 MAGILL P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF, 11.0mm

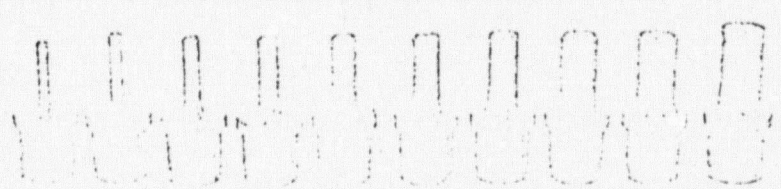


316210 COLE TUBE, P.V.C., 8 FG
316211 COLE TUBE, P.V.C., 10 FG
316212 COLE TUBE, P.V.C., 12 FG
316213 COLE TUBE, P.V.C., 14 FG
●316214 COLE TUBE, P.V.C., 16 FG
316215 COLE TUBE, P.V.C., 18 FG

316220 MURPHY R.R. ENDOTRACHEAL TUBE, BEVELED WITH CUFF, 5.0mm
316221 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 5.5mm
316222 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 6.0mm
316223 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 6.5mm
316224 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 7.0mm
316225 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 7.5mm
316226 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 8.0mm
316227 MURPHY R.R. ENDOTRACHEAL TUBE, CUFF WITH INFLATION VALVE, 8.5mm
316228 MURPHY R.R. ENDOTRACHEAL TUBE CUFF WITH INFLATION VALVE, 9.0mm
316229 MURPHY R.R. ENDOTRACHEAL TUBE CUFF WITH INFLATION VALVE, 9.5mm
316230 MURPHY R.R. ENDOTRACHEAL TUBE CUFF WITH INFLATION VALVE, 10.0mm
316232 MURPHY R.R. ENDOTRACHEAL TUBE CUFF WITH INFLATION VALVE, 11.0mm

316240 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 5.0mm
316241 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 5.5mm
316242 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 6.0mm
316243 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 6.5mm
316244 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 7.0mm
316245 MURPHY P.V.C. ENDOTRACHEAL TUBE, BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 7.5mm
●316246 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 8.0mm
316247 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 8.5mm
316248 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 9.0mm
316249 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 9.5mm
316250 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 10.0mm
316252 MURPHY P.V.C. ENDOTRACHEAL TUBE BEVELED WITH CUFF INFLATION VALVE AND 15MM ADAPTER, 11.0mm

316260 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 5.0mm
316261 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 5.5mm
316262 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 6.0mm
316263 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 6.5mm
316264 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 7.0mm
316265 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 7.5mm
316266 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 8.0mm
316267 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 8.5mm
316268 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 9.0mm
316269 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 9.5mm
316270 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 10.0mm
316271 MURPHY ENDOTRACHEAL TUBE, P.V.C. BEVELED W/O CUFF, 11.0mm
316272 MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 5.5mm
316273 MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 6.0mm
316274 MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 6.5mm
316275 MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 10.0mm
316277 MURPHY ENDOTRACHEAL TUBE, P.V.C., BEVELED W/O CUFF, 11.0mm



315034 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 3.0mm
315035 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 4.0mm
315036 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 5.0mm
315040 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 6.0mm
315042 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 7.0mm
315044 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 8.0mm
315045 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 9.0mm
315051 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 10.0mm
315052 ENDOTRACHEAL TUBE CONNECTOR, PLASTIC 11.0mm

CX-147-K

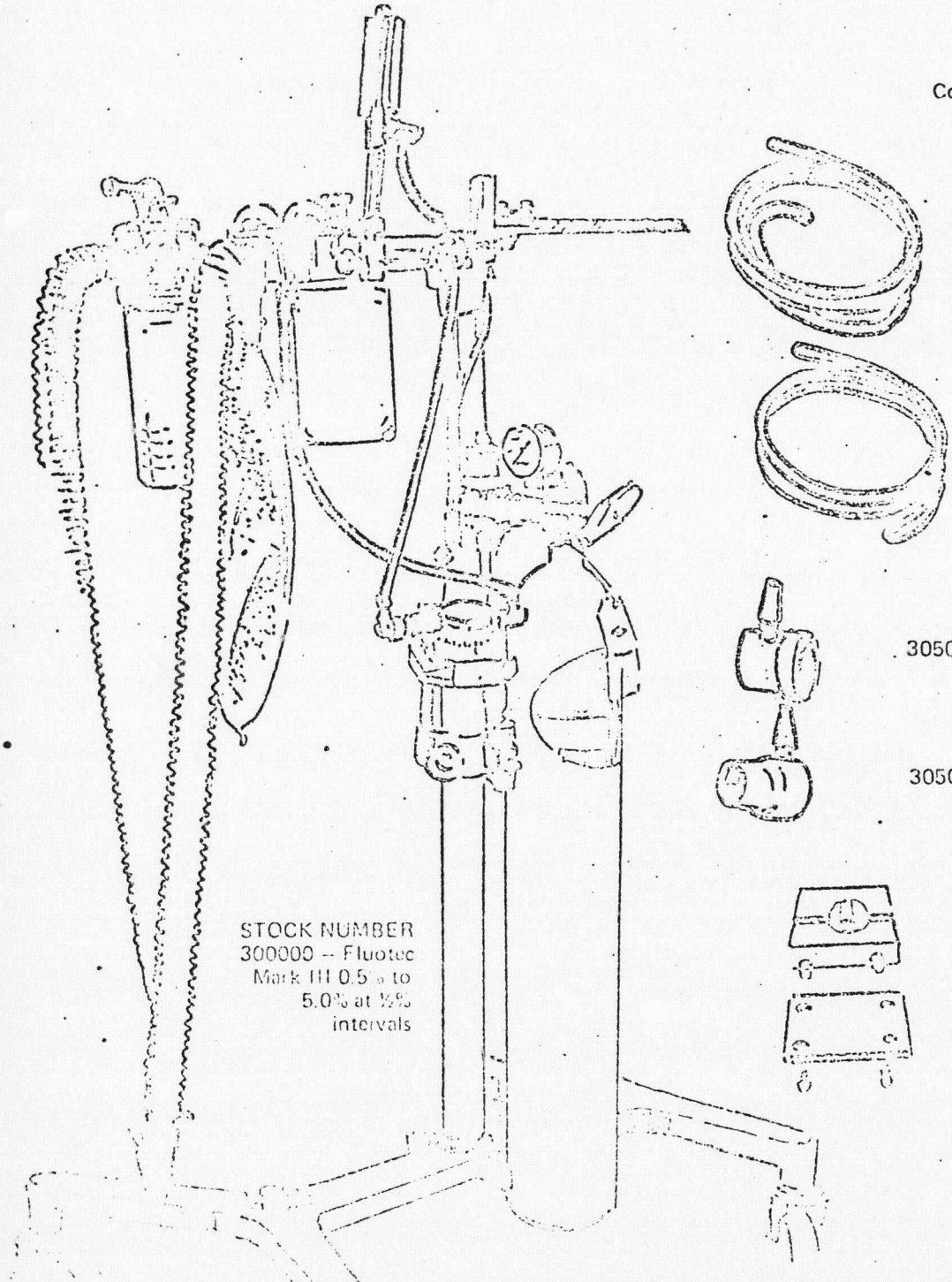
A 4443

BRACKET AND HARDWARE FOR MOUNTING FLUOTEC MARK III ON OHIO MODEL 970

FS–FB–971

STOCK NUMBER 305009
Complete Kit: includes all necessary hardware to mount Fluotec Mark III Vaporizer on the Ohio Model 970 anesthesia machine.

Stock number and description of each item included in the kit are called out below.



315075 2–36" – 1/4" black tubing

305072 FS–2A Inlet Tubing Adapter

305073 FS–2 Outlet Tubing Adapter

305007 Fluotec Mark III Post Bracket and Plate

STOCK NUMBER
300000 – Fluotec Mark III 0.5% to 5.0% at ½% intervals

Fraser Sweatman Incorporated

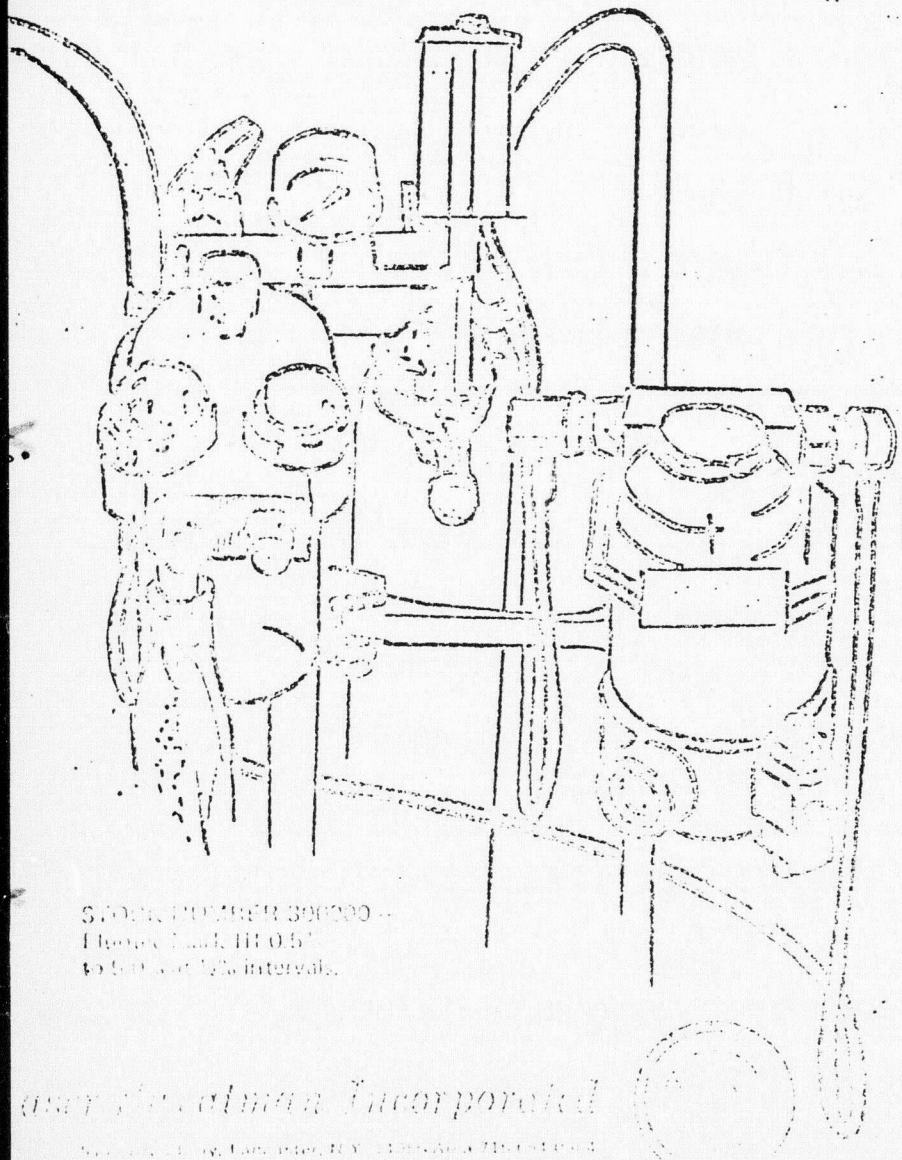
A 4444

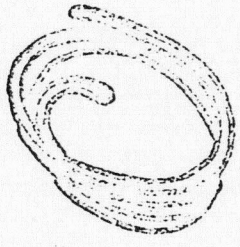
CA-147-L

BRACKET AND HARDWARE FOR MOUNTING FLUOTEC MARK III ON OHIO MODEL 960

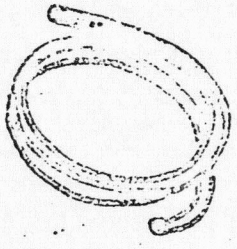
STOCK NUMBER 305088
Complete Kit: includes all necessary hardware to mount Fluotec Mark III Vaporizer on the Ohio Model 960 anesthesia machine.

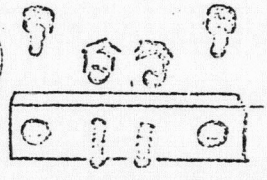
Stock number and description of each item included in the kit are called out below.





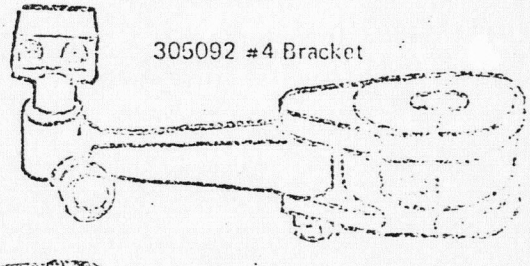
315075 2–36" x 1/4" black tubing





305088
FS–43 plate

305092 #4 Bracket



305073 FS–2 Outlet
Tubing Adapter

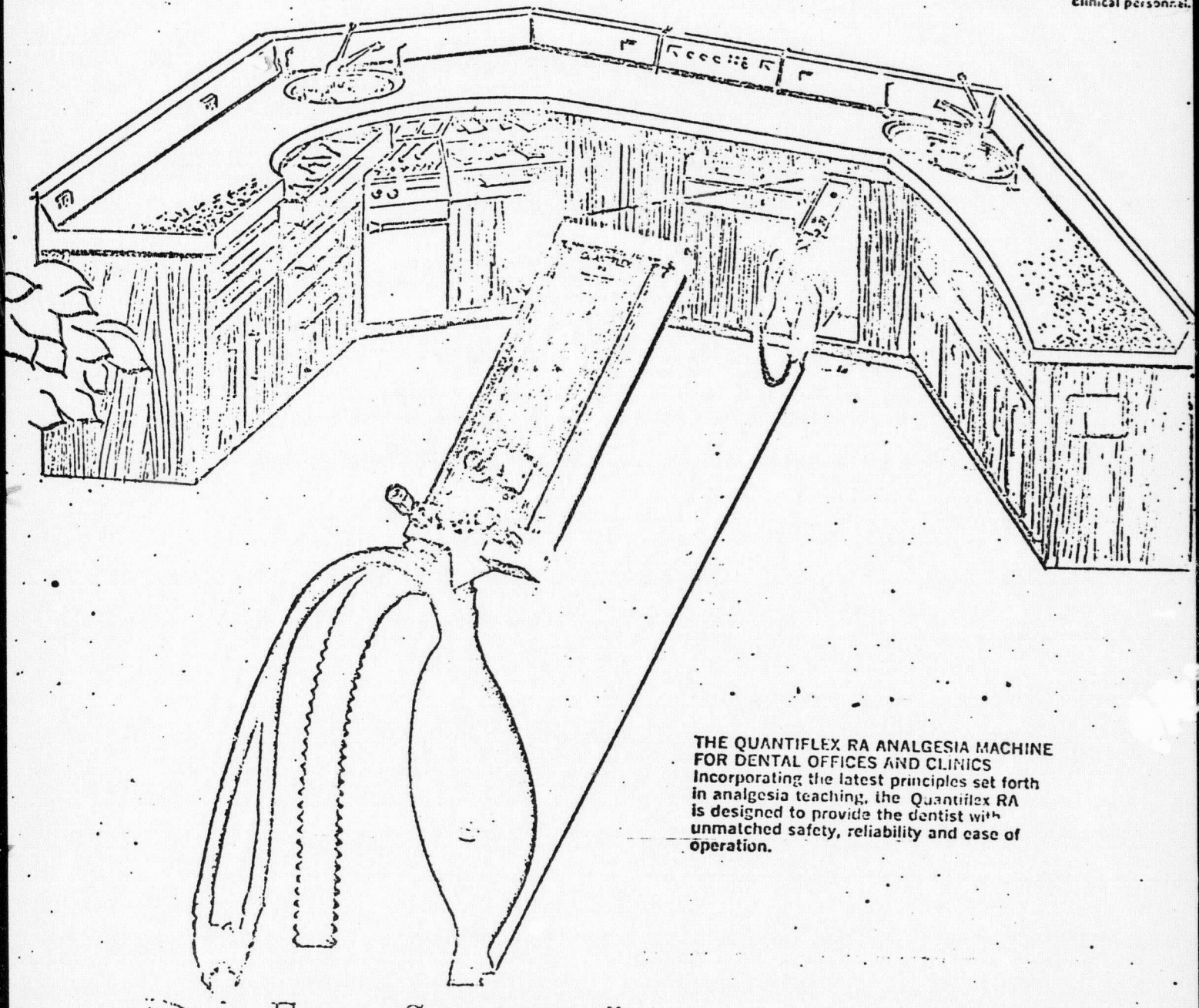
305072 FS–2A Inlet
Tubing Adapter

Ohio Medical Products Incorporated

4445

QUANTIFLEX RA

This brochure is intended for use by dentists and qualified hospital and clinical personnel.



THE QUANTIFLEX RA ANALGESIA MACHINE FOR DENTAL OFFICES AND CLINICS
Incorporating the latest principles set forth in analgesia teaching, the Quantiflex RA is designed to provide the dentist with unmatched safety, reliability and ease of operation.

Fraser Sweatman Incorporated
5490 Broadway, Lancaster, N.Y. 14086 Area 716 684-0564

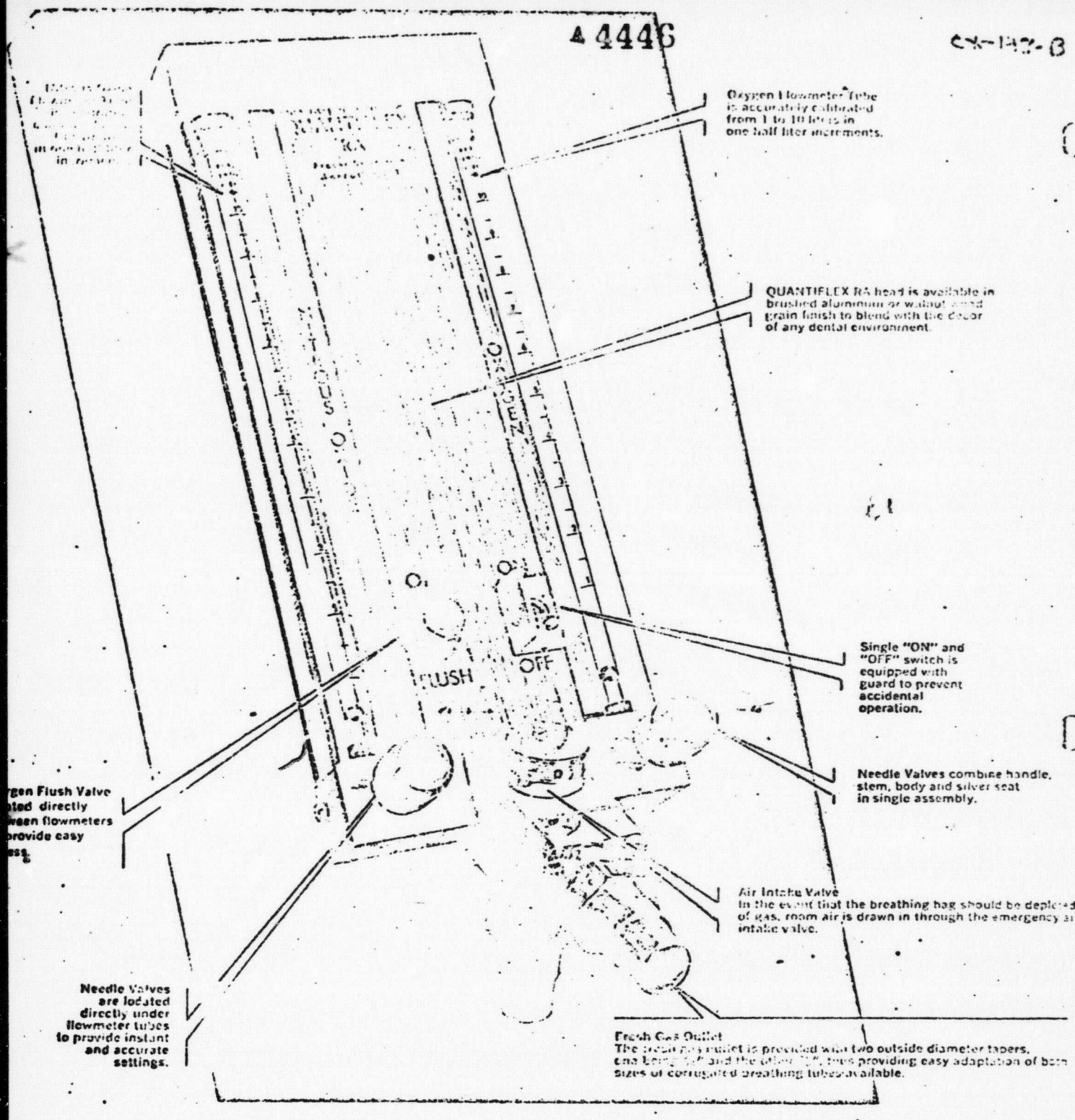
ASSOCIATED COMPANIES
Fraser Sweatman (Canada) Ltd.
50 Manley Road, Scarborough, Ontario, Canada, Area 416 752-1790

Cyprane Limited
West Lane, Keighley Yorkshire, England

FOR SAFETY

A 4446

EX-142-B



ADVANCED SAFETY FEATURES INCLUDE:

- Unequalled safety has been designed into the Quantiflex RA to provide a minimum oxygen concentration of approximately 23 volumes percent. A single "ON" and "OFF" switch supplies both nitrous oxide and oxygen to the flowmeters. The oxygen flowmeter is preset to give a minimum of 3 liters of oxygen per minute. The nitrous oxide flowmeter will not deliver more than 10 liters per minute if the input supply pressure is set properly.

- Oxygen fail safe system prevents gases from flowing unless oxygen pressure is available.

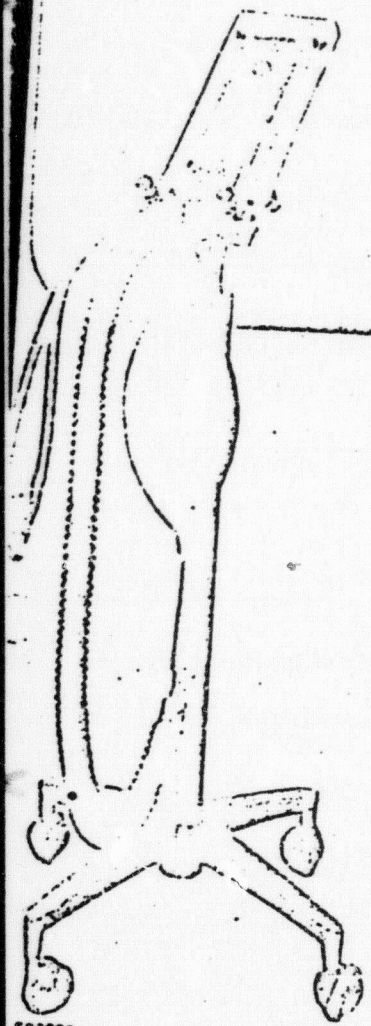
- Should oxygen supply fail during operation, both oxygen and nitrous oxide will be cut off. As the total volume of both gases falls, it falls in proportion of oxygen to nitrous oxide at which the machine was set when oxygen failure occurred.

- Air intake valve provides patient with air should oxygen supply fail and reservoir bag be depleted.

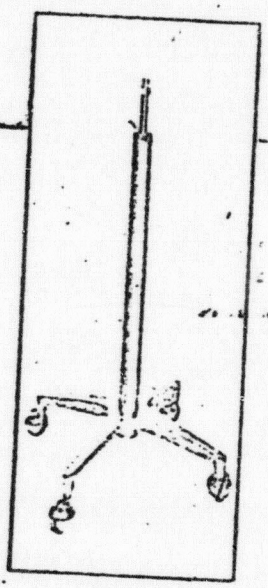
- Check valve between reservoir bag and nasal inhaler prevents accidental patient asphyxia. The valve requires an adequate quantity of oxygen flush concentration. Rebreathing to and from the reservoir bag is eliminated.

A 4447

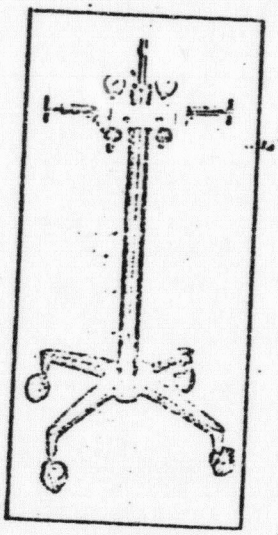
EX-1145-2



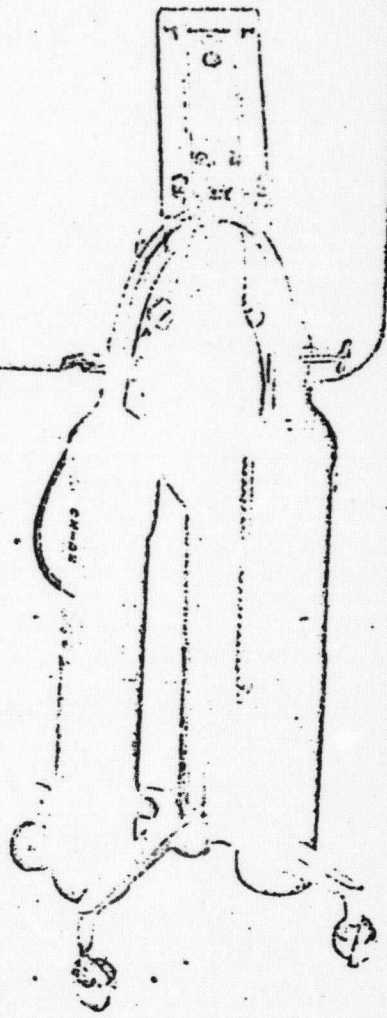
500000
Quantiflex RA Stand Mounted
Includes RA head, stand, medium nasal inhaler, 36" corrugated breathing tube and 3 liter breathing bag.



505000
Quantiflex RA Stand
Includes adjustable mount.
The RA stand is height adjustable from 32" to 45".
Large swivel casters provide ease of movement.



505001
Quantiflex RA Stand
Includes adjustable mount.
Height adjustable from 32" to 45".
One yoke each for oxygen and nitrous oxide. A pressure regulator is provided along with contents gauge for oxygen and nitrous oxide.



500002
Quantiflex RA Stand Mounted.
Includes RA Head, adjustable stand, one yoke each for oxygen and nitrous oxide including; high pressure hose assemblies, medium nasal inhaler, 36" corrugated breathing tube and 3 liter breathing bag.

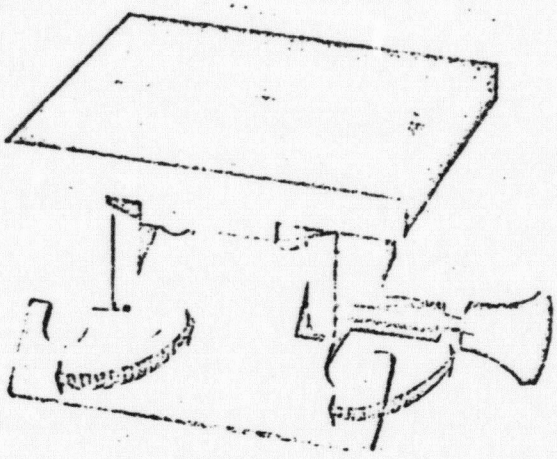
- Oxygen flush valve is located on the face of the Quantiflex RA head to provide rapid inflation of the reservoir bag with 100% oxygen if necessary.

- The Quantiflex RA head with its compact, slim design helps allay the patient's anxiety while at the same time providing the doctor with safe, uncomplicated controls. The flowmeters and head are placed at a 45° angle for ease of operation and viewing. The oxygen flowmeter tube with 1 to 10 liter graduations is located to the right of the head, and the nitrous oxide flowmeter tube with 1 to 10 liter graduations is located to the left of the head.

4448

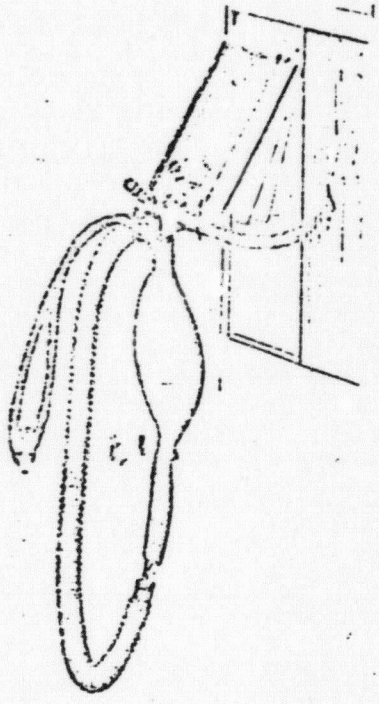
2-147-D

MOUNTING BRACKETS FOR QUANTIFLEX RA ANALGESIA MACHINES



500003

QUANTIFLEX RA CABINET MOUNTED, INCLUDES: RA HEAD, HINGE MOUNTING BRACKET, MEDIUM NASAL INHALER, 36" CORRUGATED BREATHING TUBE AND 3 LITER BREATHING BAG.

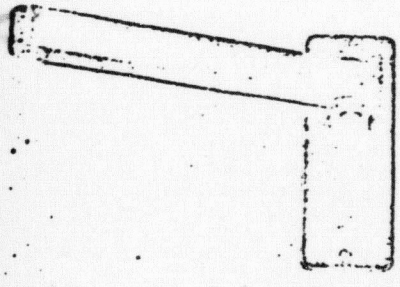


Designed to give out of sight storage yet provide quick and easy access. In addition to swinging out for use, the cabinet mount allows the RA Quantiflex head to be swiveled from side to side. Removing RA unit for movement from one operatory to another is easily accomplished.

Quantiflex RA Cabinet mount requires a minimum height of 19" and width of 6". Can be installed in any existing cabinet with these specifications.

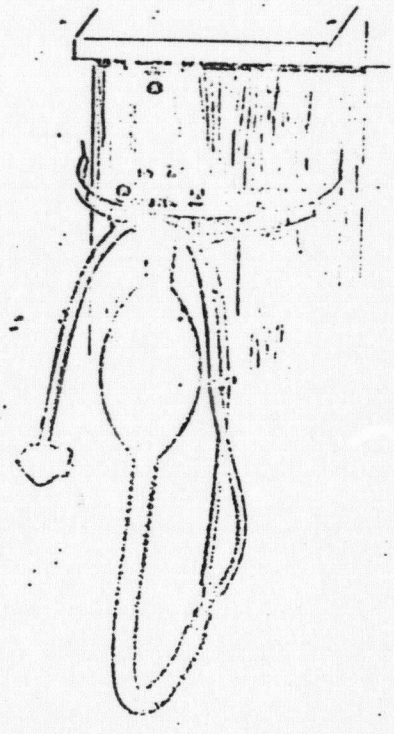
Adapter (Stock Number 505011) available to install RA unit in Pelton Crane Executive Cabinet*.

*The Pelton & Crane Company, Charlotte, N.C. 28203



500004

QUANTIFLEX RA WALL MOUNTED, INCLUDES: RA HEAD, WALL MOUNTING PLATE WITH 12" ARM, MEDIUM NASAL INHALER, 36" CORRUGATED BREATHING TUBE AND 3 LITER BREATHING BAG.



If floor space is at a premium, two convenient mounts are available. Wall mount (505005) arm has a total length of 12". The distance between the wall and the RA controls is a total distance of 17". If greater reach is desired a 24" wall mount (505006) with double swivel arm is available. Wall mount allows Quantiflex RA unit to be swung out of the way when not in use. For complete positioning control the wall mount in addition to swinging from side to side allows the RA head to pivot. Head can easily be removed from arm for moving from one area to another. Wall mounted Quantiflex RA can be installed on any existing wall or operatory furniture.

Fraser Sweatman Incorporated

AUTOMATIC CHANGE-OVER MANIFOLD SYSTEM

A 4449

CY-148-E

FRASER SWEATMAN
INCORPORATED

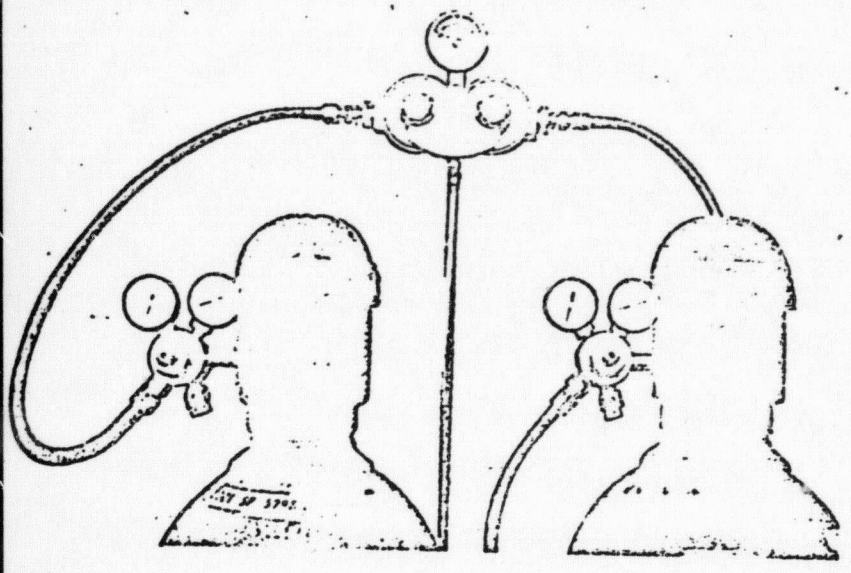


Fig. 1 305143 Two oxygen, one nitrous oxide automatic change-over system.

The Automatic Change-Over Manifold System is designed for installations of oxygen and nitrous oxide cylinders where the contents cannot be easily monitored, or where the doctor wants to be relieved of constantly checking his gas supply. By using this automatic system, a full tank of gas is held in reserve and automatically put into use when the service supply cylinder is depleted.

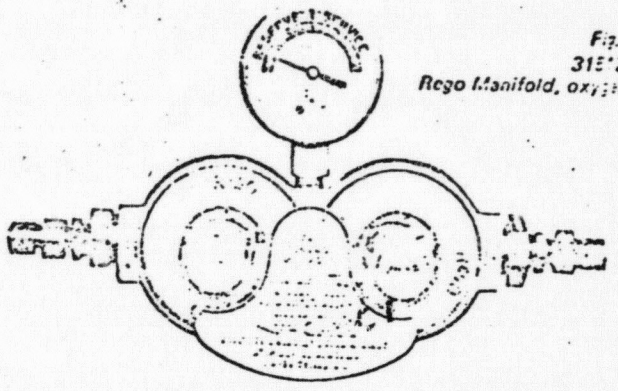


Fig. 2
315120
Rego Manifold, oxygen.

The easy to read gauge on the Rego Manifold (Fig 2) indicates whether the system is running from the service or reserve tank. Only a periodic check of the cylinders is required to see if the manifold has switched to the reserve tank. If the gauge indicates that the reserve cylinder is being used, the empty tank should be replaced. When the gas supplier replaces the empty cylinder, he simply turns the lever located on the manifold 180° to reset the Rego Manifold. This makes the reserve tank the service cylinder, and the new tank is now held in reserve for automatic use when required.

The Rego Manifold has been used throughout the country in hospitals and dental offices, and has proven to be a reliable piece of equipment.

Regulators are connected to the Rego Manifold by a flexible hose assembly which allows for ease of replacing and positioning cylinders.

The Automatic Change-Over Manifold is available in the following manifold packages:

305143: Two oxygen and one nitrous oxide Automatic Change-Over System, includes: two oxygen regulators, one nitrous oxide regulator, two 3' oxygen hose assemblies DISS to DISS, one 3' nitrous oxide hose assembly DISS to DISS, one nitrous oxide DISS male fitting, one Rego Manifold oxygen with mounting brackets. (Fig. 1)

305144: Two oxygen and two nitrous oxide Automatic Change-Over System, includes: two oxygen regulators, two nitrous oxide regulators, two 3' oxygen hose assemblies DISS to DISS, two 3' nitrous oxide hose assemblies DISS to DISS, a Rego Manifold for oxygen with mounting brackets and a Rego Manifold for nitrous oxide with mounting brackets.

Should you require cylinders in addition to those called out in the standard manifold packages, please add one 305103 oxygen manifold for each additional oxygen cylinder and one 305109 nitrous oxide manifold for each additional nitrous oxide cylinder.

FOR SAFETY

For more information contact

Fraser Sweatman Incorporated

8490 Broadway, Lancaster, N.Y. 14086, Area 716 684-0864

Fraser Sweatman (Canada) Limited,
35 Malley Road, Scarborough, Ontario, Canada, Area 416-752-1760

Cyprane Limited

MANUAL MANIFOLD SYSTEM

A 4450

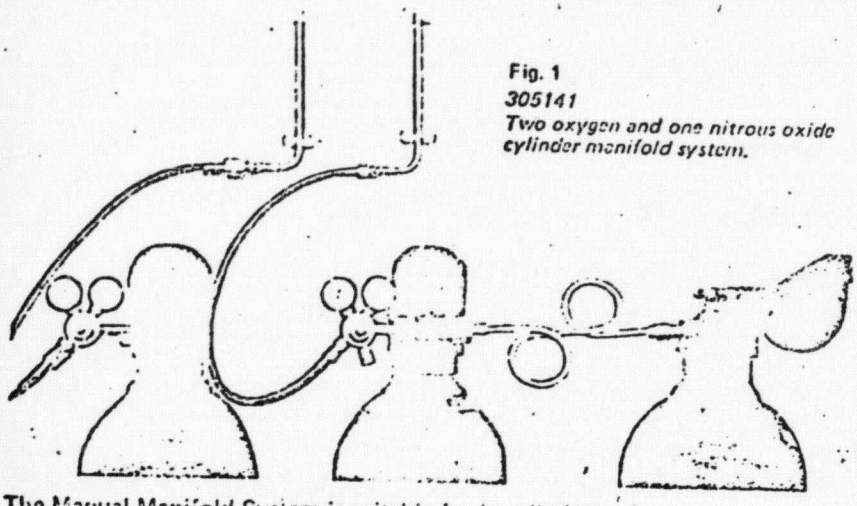


Fig. 1
305141
Two oxygen and one nitrous oxide cylinder manifold system.

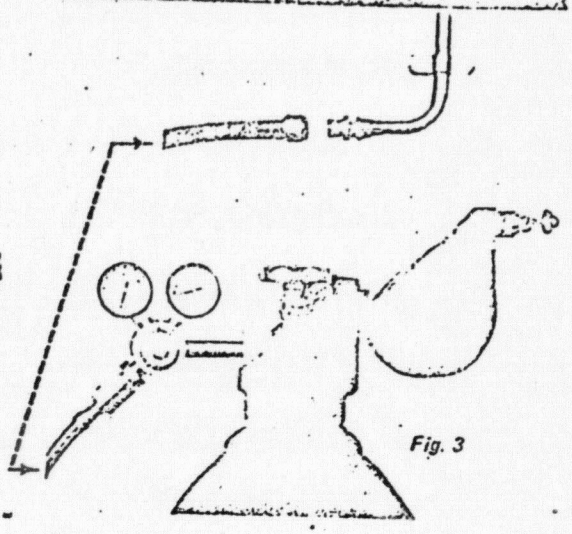
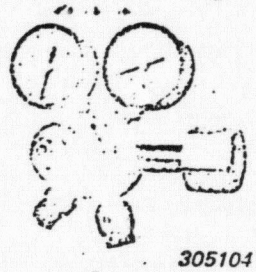


Fig. 3

The Manual Manifold System is suitable for installations of oxygen and nitrous oxide where the contents of the cylinders can be easily and routinely checked.

In this system two or more cylinders of O_2 or N_2O can be connected by using a manifold and tee. Only one cylinder of O_2 or N_2O should be in use at a time. If one cylinder is depleted, the valve on the empty cylinder is closed and the full cylinder connected by the manifold is then opened and put in use. One regulator attached to the manifold tee serves both connected cylinders.



305104
Oxygen regulator for large cylinder.

Fig. 2

The regulator is connected to the copper piping system by a flexible hose assembly (Fig. 3) that allows for easy replacing and positioning of cylinders.

Also available for each gas cylinder is an alarm that gives audible warning when the cylinder pressure is low. The alarm is pre-set to give warning at 500 P.S.I., allowing ample time to have the cylinder replaced.

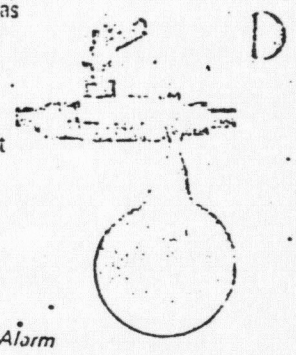
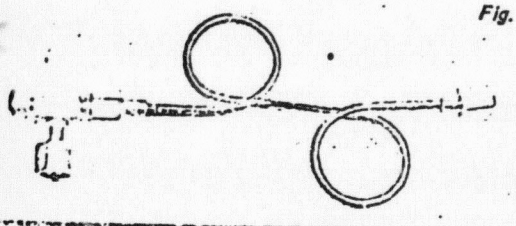


Fig. 4
315105
Cylinder Alarm



305108
Oxygen manifold and tee

The Manual Manifold System is available in the following manifold packages:

305140: One cylinder each oxygen and nitrous oxide manifold system, includes: one oxygen regulator, one nitrous oxide regulator, one 3' oxygen hose assembly DISS to DISS, one 3' nitrous oxide hose assembly DISS to DISS, one DISS male oxygen and one DISS male nitrous oxide.

305141: Two oxygen and one nitrous oxide cylinder manifold system, includes: one oxygen regulator, one nitrous oxide regulator, oxygen manifold, 3' oxygen hose assembly DISS to DISS, 3' nitrous oxide hose assembly DISS to DISS, one DISS male oxygen and one DISS male nitrous oxide. (Fig. 1)

305142: Two cylinders each oxygen and nitrous oxide manifold system, includes: one oxygen regulator, one nitrous oxide regulator, oxygen manifold, nitrous oxide manifold, 3' oxygen hose assembly DISS to DISS, 3' nitrous oxide hose assembly DISS to DISS, one DISS male oxygen and one DISS male nitrous oxide.

Should you require cylinders in addition to those called out in the standard manifold packages, please add one DISS male oxygen connector for each additional oxygen cylinder and one DISS male nitrous oxide connector for each additional nitrous oxide cylinder.

For more information contact:

Fraser Sweatman Incorporated

5490 Broadway, Lancaster, N.Y. 14086, Area 716 684 0564

Fraser Sweatman (Canada) Limited,
36 Valley Road, Scarborough, Ontario, Canada, Area 416 752 1790

Cyprane Limited, Low Decoy Industrial Estate, Scott Street, Keighley, Yorkshire, England

FOR SAFETY

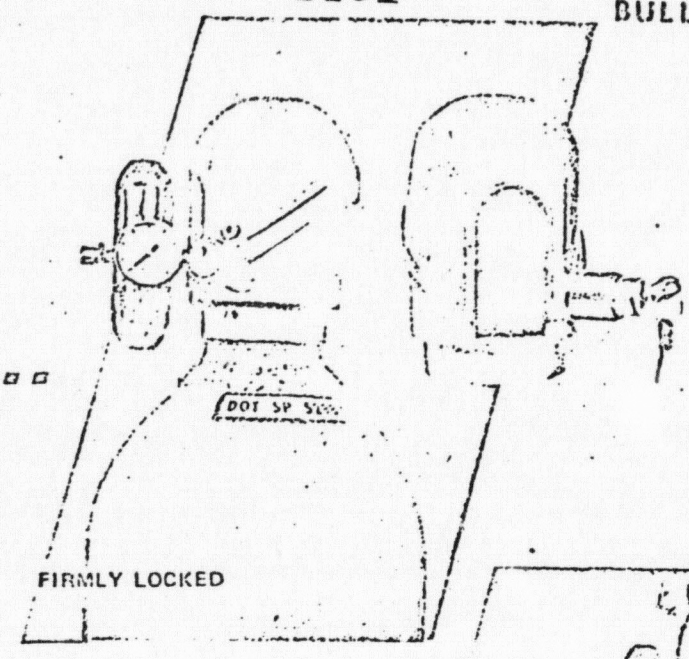
...IN U.S.A.

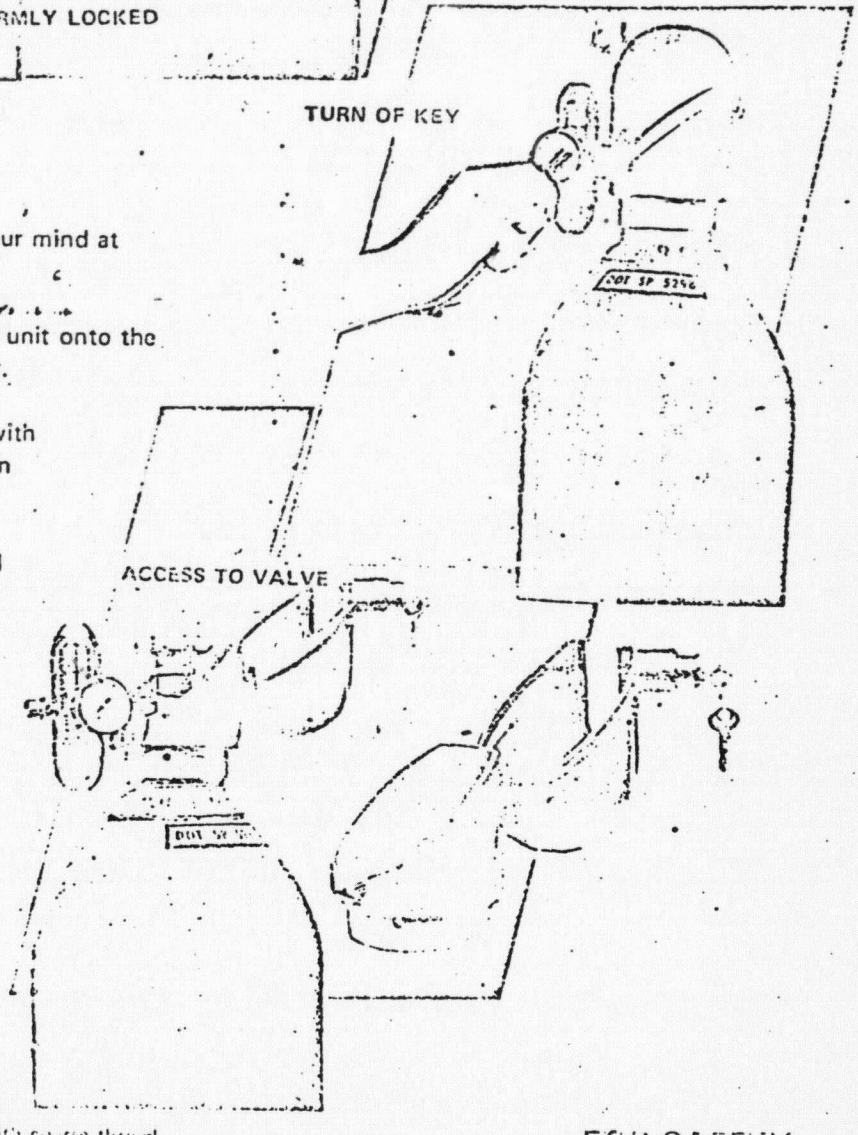
A 4451

BULLETIN KG-871

CX-143-G

LOCK IT UP.... WITH KNIGHT GUARD™





Now with a simple twist of a key you can put your mind at ease when leaving nitrous oxide unattended.

Install KNIGHT GUARD by simply threading the unit onto the cylinder. Easily changed from cylinder to cylinder.

The cover closes over the valve and firmly locks with positive action key lock. Solid, steel locking action discourages tampering with the valve.

With a simple turn of the key, the lock is released and the cover can be flipped back for easy unrestricted access to the valve. Connections are not disturbed when locking or unlocking KNIGHT GUARD.

KNIGHT GUARD'S solid construction protects the cylinder valve from damage should the cylinder fall. Units are color coded to match oxygen and nitrous oxide cylinders.

KNIGHT GUARD is available with a lock (2 keys) for nitrous oxide cylinder, without lock for oxygen cylinder.

STOCK NUMBER	DESCRIPTION
60-020	N_2O (Blue with lock) with course thread
60-021	N_2O (Blue with lock) with fine thread
60-023	O_2 (Green without lock) with course thread
60-024	O_2 (Green without lock) with fine thread

FOR SAFETY

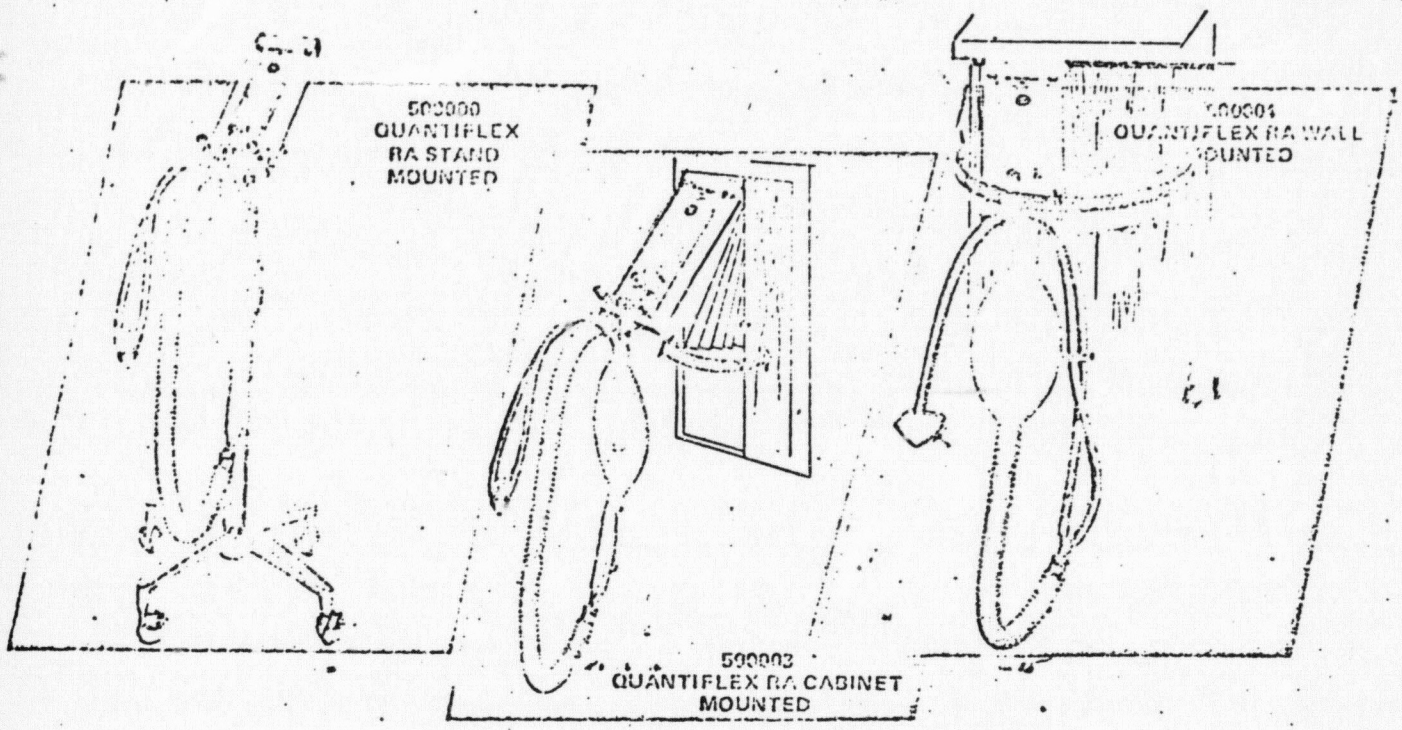
Fraser Sweatman Incorporated

A 4452

OTHER PRODUCTS FOR DENTISTRY AVAILABLE FROM

[redacted]

Ex-143-H

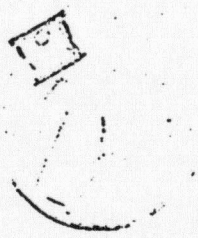


QUANTIFLEX RA ANALGESIA MACHINE FOR DENTAL OFFICES AND CLINICS

Incorporating the latest principles set forth in analgesia teaching, the Quantiflex RA is designed to provide the dentist with unmatched safety, reliability and ease of operation.

RUBBER ACCESSORIES

515001	Nasal inhaler, small, double length
515002	Nasal inhaler, medium, double length
515003	Nasal inhaler, large, double length
316020	36" corrugated breathing tube
316011	1 liter rebreathing bag
316012	2 liter rebreathing bag
316013	3 liter rebreathing bag
316015	5 liter rebreathing bag



For more information contact:

Fraser Sweatman Incorporated

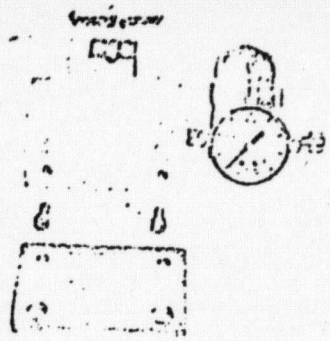
5400 Broadway, Lancaster, N.Y. 14086, Area 716 634 0564

Fraser Sweatman (Canada) Limited
36 Mallard Road, Scarborough, Ontario, Canada, Area 416 752 1220

Cyprane Limited, West Lane, Keighley, Yorkshire, England

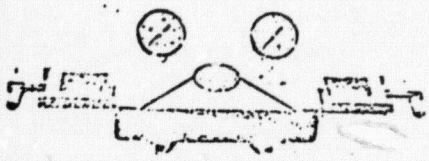
A 4453 REGULATORS
HOSE
ASSEMBLIES

CX-142-C



○305030 "E" CYLINDER, 02, SINGLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, AND FITTINGS

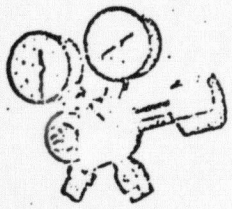
305031 "E" CYLINDER, 02, DOUBLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, CHECK VALVES, AND FITTINGS
305032 "E" CYLINDER, N20, SINGLE TANK YOKE BRACKET: 36" HOSE DISS TO DISS, REGULATOR, GAUGE, AND FITTINGS



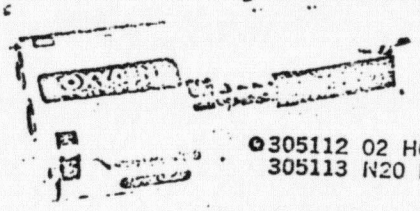
○305034 "E" CYLINDER, 02 & N20, DOUBLE YOKE TANK BRACKET: TWO (2) 36" HOSES DISS TO DISS, REGULATORS, GAUGES, AND FITTINGS
305035 "E" CYLINDER, 02 & N20, FOUR (4) YOKE TANK BRACKET: TWO (2) 36" HOSES, DISS TO DISS, REGULATORS, GAUGES, CHECK VALVES, AND FITTINGS

305100 YOKE REGULATOR, 02, SINGLE STAGE, LESS HOSE

305101 YOKE REGULATOR, N20, SINGLE STAGE, LESS HOSE

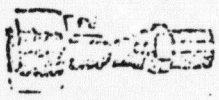


305108 02 MANIFOLD, INCLUDES: PIGTAIL & TEE
305109 N20 MANIFOLD, INCLUDES: PIGTAIL & TEE
305110 02 HOSE ASSEMBLY DISS/DISS
305111 N20 HOSE ASSEMBLY DISS/DISS



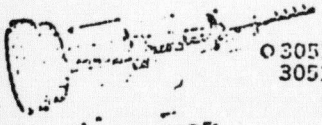
○305104 LARGE CYLINDER REGULATOR, 02, SINGLE STAGE, LESS HOSE
305105 LARGE CYLINDER REGULATOR, N20, SINGLE STAGE, LESS HOSE

○305112 02 HOSE ASSEMBLY DISS/NCG FEMALE
305113 N20 HOSE ASSEMBLY DISS/NCG FEMALE

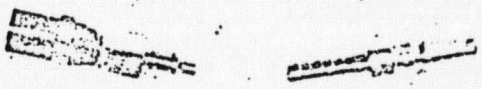


○305114 02 HOSE ASSEMBLY DISS/PURITAN FEMALE
305115 N20 HOSE ASSEMBLY DISS/PURITAN FEMALE

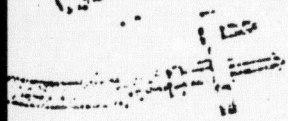
○305116 02 HOSE ASSEMBLY DISS/SCHRADER FEMALE
305117 N20 HOSE ASSEMBLY DISS/SCHRADER FEMALE



○305118 02 HOSE ASSEMBLY DISS/OHIO FEMALE
305119 N20 HOSE ASSEMBLY DISS/OHIO FEMALE



○
305122 02 HOSE ASSEMBLY DISS/PURITAN MALE
305123 N20 HOSE ASSEMBLY DISS/PURITAN MALE
305124 02 HOSE ASSEMBLY DISS/SCHRADER MALE ○
305125 N20 HOSE ASSEMBLY DISS/SCHRADER MALE

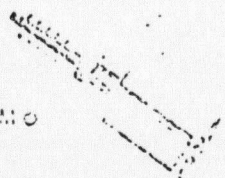


○305120 02 HOSE ASSEMBLY DISS/NCG MALE
305121 N20 HOSE ASSEMBLY DISS/NCG MALE

○305126 02 HOSE ASSEMBLY DISS/OHIO MALE
305127 N20 HOSE ASSEMBLY DISS/OHIO MALE

○305040 02 DISS MALE ¼ NPT
305041 N20 MALE ⅛ NPT○

315069 02 NUT & STEM
315070 N20 NUT & STEM ○



315071 02 HOSE
315072 N20 HOSE
○315073 FERRULE (TO SECURE HOSE FITTINGS)
315074 CYLINDER HAND WHEEL (E" CYLINDER)
315075 BLACK RUBBER TUBING, CONDUCTIVE [illegible] I.D.
315076 BLACK RUBBER TUBING, CONDUCTIVE [illegible] I.D.

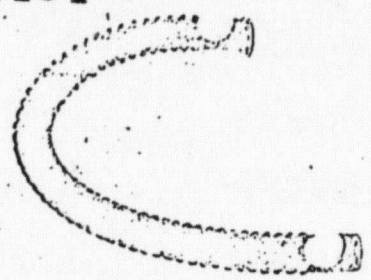
305130 QUICK CONNECT OUTLET STATION FOR 02, ONLY, EXPOSED
305131 QUICK CONNECT OUTLET STATION FOR N20, ONLY, EXPOSED

305132 QUICK CONNECT OUTLET STATION FOR 02, ONLY, CONCEALED
305133 QUICK CONNECT OUTLET STATION FOR N20, ONLY, CONCEALED

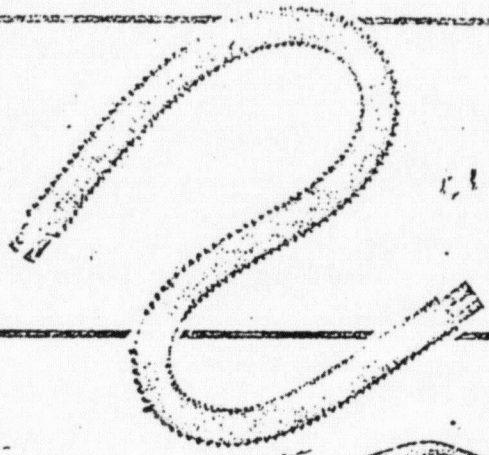
RUBBER GOODS ASSEMBLIES

A 4454

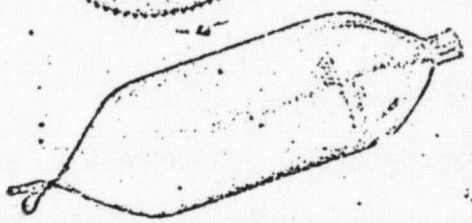
EX-143-J



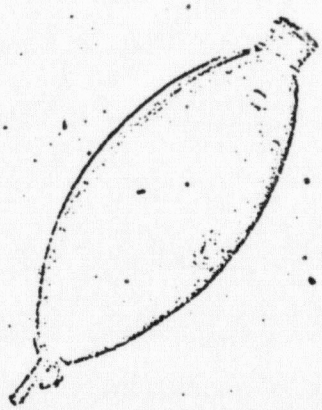
316019 CONDUCTIVE BREATHING TUBE ½" INSERT
12" LONG



316020 36" CONDUCTIFLEX BREATHING TUBE ⅞"
INSERT



316035 CONDUCTIFLEX SQUARE REBREATHING BAG
3.5 LITER
316050 CONDUCTIFLEX SQUARE REBREATHING BAG
5 LITER



316041 CONDUCTIFLEX OVAL REBREATHING BAG
1 LITER
316042 CONDUCTIFLEX OVAL REBREATHING BAG
2 LITER
316043 CONDUCTIFLEX OVAL REBREATHING BAG
3 LITER
316045 CONDUCTIFLEX OVAL REBREATHING BAG
5 LITER

316[illegible] ESOPHAGEAL STETHOSCOPE, SMALL
316[illegible] ESOPHAGEAL STETHOSCOPE, MEDIUM
316[illegible] ESOPHAGEAL STETHOSCOPE, LARGE
316[illegible] ESOPHAGEAL STETHOSCOPE, [illegible]
316[illegible] STETHOSCOPES, FAN PACK
316[illegible] PICKUPS, [illegible] CASE

A 4455

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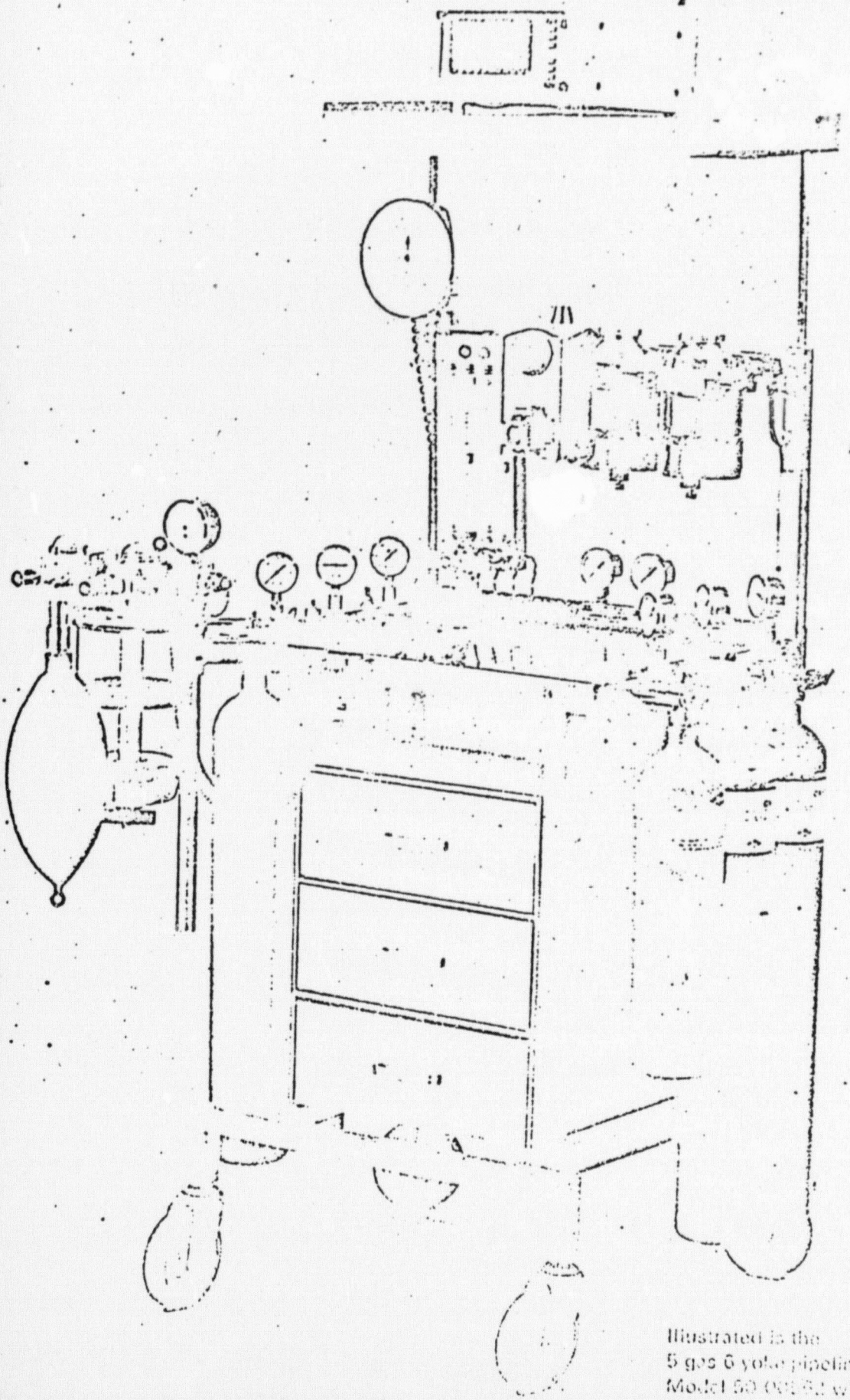
HARRIS-LAKE, INC.

A 4456 The Boyle Model 50...



Illustrated is the 5 gas 6 yoke pipeline Model 50 (with other, halothane and methoxyflurane vaporizers

4457

...is the latest of a fine range of Boyle machines.

CX-150-C

American Designed and American Manufactured

The Boyle Model 50 retains all the features which have proven valuable over the years and incorporates many new features suggested by users in recent years. These include a redesigned all welded, square stainless steel table frame; a versatile modular concept, providing for many gas and vaporizer combinations; the choice of open, closed, or semi-closed systems; provisions for mounting monitoring and other ancillary equipment allowing the anesthesiologist to choose the best unit for his requirements without incurring additional cost for custom fabrication.

Standard Specifications—All Models

Table Frame
- Stainless Steel—corrosion proof
- 1¼" square welded tubular construction for stability and strength
- Capacity for five gases, six cylinder yokes and three compensated out-of-circuit vaporizers

Caster Assemblies
- Large 5" conductive—easy mobility

Table Top
- Heavy gauge stainless steel
- Large open work area—350 square inches

Single-Drawer Unit
- Stainless construction
- Located within table frame—either top or bottom positioning
- Forms shelf when mounted in bottom position
- Machine will accommodate two additional drawer units—optional

Cylinder Yokes
- Swivel—gate type yokes—easy changing of cylinders
- Fitted with *individual* regulators and pressure gauges
- No two yokes for the same gas are manifolded through a common regulator

Piped Gases
- Inlet connections for piped oxygen and nitrous oxide
- D.I.S.S. fittings
- Connections fitted with pipeline pressure gauges

Oxygen "Fail-Safe" System
- "Fail-Safe" flow of all other gases in event of oxygen failure
- Warning Whistle can be fitted to oxygen regulator to warn against impending empty cylinders

Fresh Gases Outlet
- Incorporates oxygen flush valve—22mm tapered male outlet with 15mm female insert
- Accommodates single tube breathing assembly (Magill) or feed tube for carbon dioxide absorber

Power Take-Off
- Self-sealing check unit located in front fascia panel—oxygen powered for driving ventilators or other pneumatically operated equipment

Front-Mounted Sphygmomanometer Fitting
- For connecting sphygmomanometer cuff inflation system
- Inlet at the back of the machine is connected to a male luer fitting on the front fascia panel

I.V. Pole Mounts
- For mounting standard ½" I.V. poles in each of the back bar uprights
- Also used to affix overhead shelf

Vaporizer Units
- Wide back bar holds up to three vaporizers of the out-of-circuit type

Non-Return Valve
- Located downstream behind the fresh gases outlet mount
- Prevents back-pressuring of the vaporizers

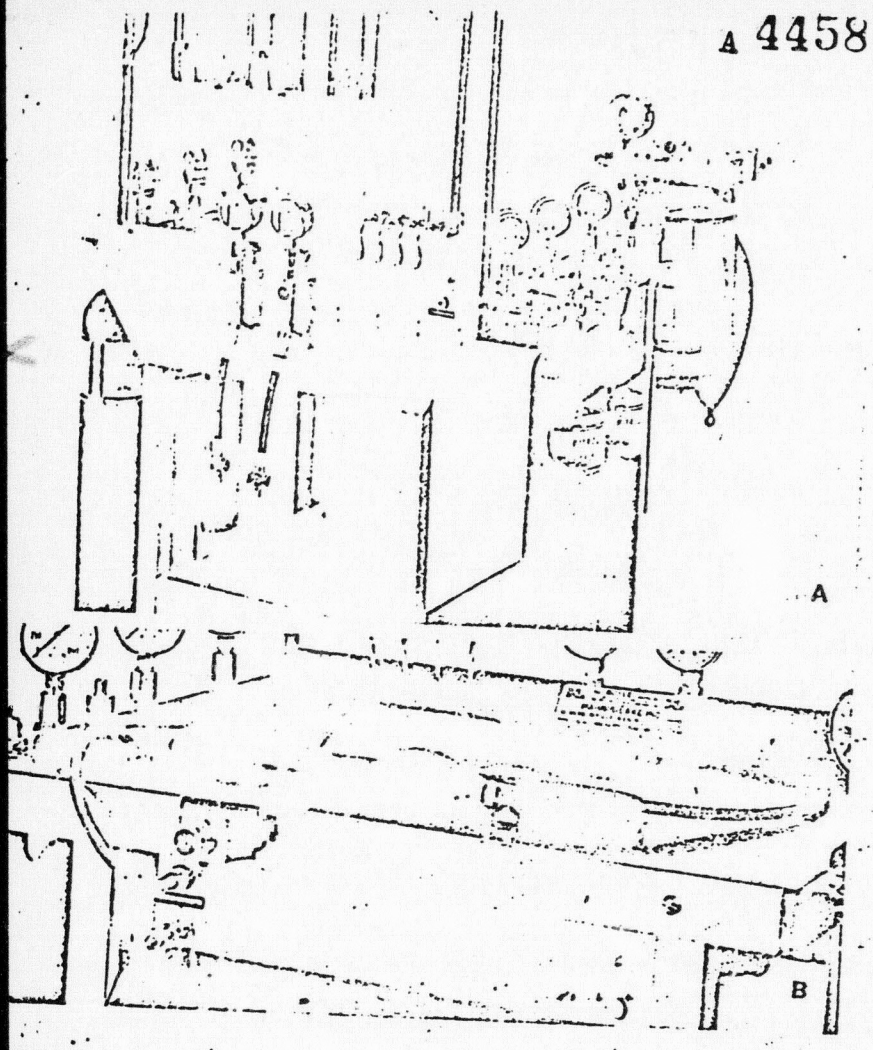
Filter Discs
- Sintered bronze
- Located in cylinder yokes, inlet stems of regulators, in base of rotameter tubes
- Cylindrical filters are incorporated in the piped gas inlet connections

Absorber Mounting Bracket
- Adjustable-collet type with a positive lock mechanism
- Either left- or right-hand mounted

*Manufactured under license from the British Oxygen Company Limited

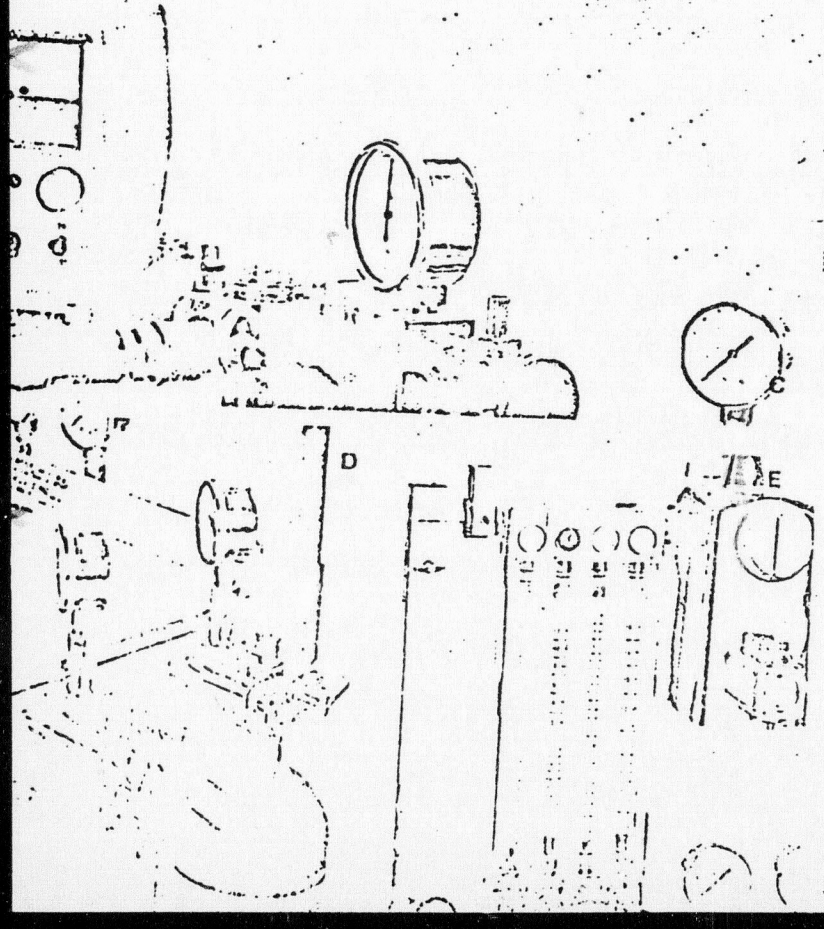
A 4458 The Boyle Model 50

C-150-D



A
Rear view of Boyle Model 50 illustrating piped gas connections incorporating line pressure gauges.

B
Convenient front-mounted oxygen powered outlet and sphygmomanometer cuff inflation attachment are standard on all models.



C
Illustrated is an oxygen analyzer mounted on the inspiratory side of the breathing circuit for the continuous monitoring of oxygen concentration.

D
For rapid cylinder change, quick coupling swivel gate type yokes are standard on all models. The semi-permanent sealing washers supplied eliminate the need for replacing yoke washers with each cylinder and assure a gas-tight seal with minimum thumb-screw pressure.

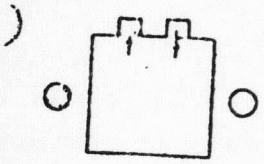
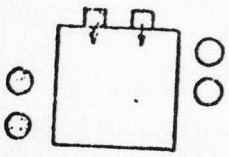
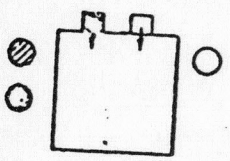
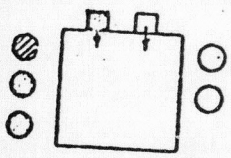
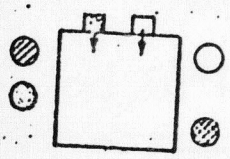
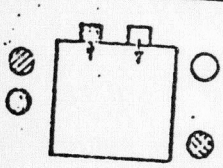
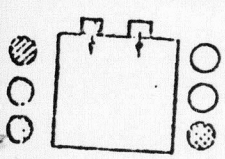
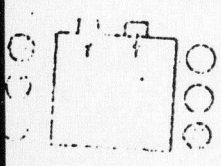
E
Flowmeter Unit is available in 2, 3, 4 or 5 gas configurations. Utilizes rotameters in dual tapered tubes providing both "fine" and "coarse" flows in a single tube with only one needle valve for each gas. Flowmeter unit back plate is luminous for viewing in darkened room.

Gas	Flowmeter Range
Oxygen	100cc — 8,000cc
Nitrous Oxide	200cc — 12,000cc
Cyclopropane	20cc — 1,000cc
Helium	200cc — 8,000cc
Carbon Dioxide	20cc — 1,000cc

Available Models—Basic Units Less Vaporizers and Absorber

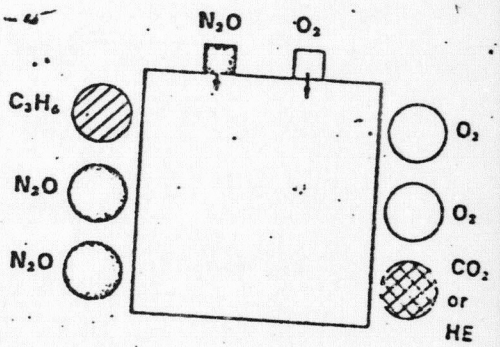
A 4459

The Boyle Model 50

SYMBOL	MODEL NO.	DESCRIPTION	PRICE
	50-00222	2 Gas, 2 Yoke, Pipeline Unit for O_2 and N_2O	$1,025.00
	50-00242	2 Gas, 4 Yoke, Pipeline Unit for O_2 and N_2O	$1,150.00
	50-00332	3 Gas, 3 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6$	$1,150.00
	50-00352	3 Gas, 5 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6$	$1,295.00
	50-00442	4 Gas, 4 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6/He$	$1,390.00
	50-01442	4 Gas, 4 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6/CO_2$	$1,390.00
	50-00462	4 Gas, 6 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6/He$	$1,460.00
	50-01462	4 Gas, 6 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6/CO_2$	$1,460.00
	50-00562	5 Gas, 6 Yoke, Pipeline Unit for	

KEY TO DIAGRAMS

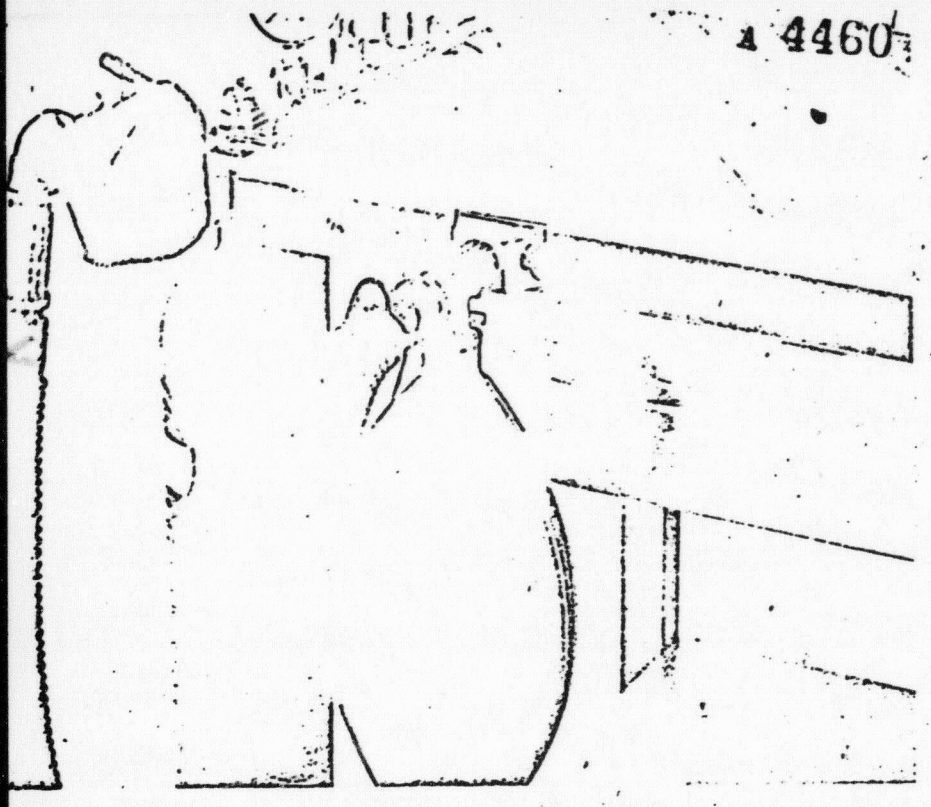
PIPELINE

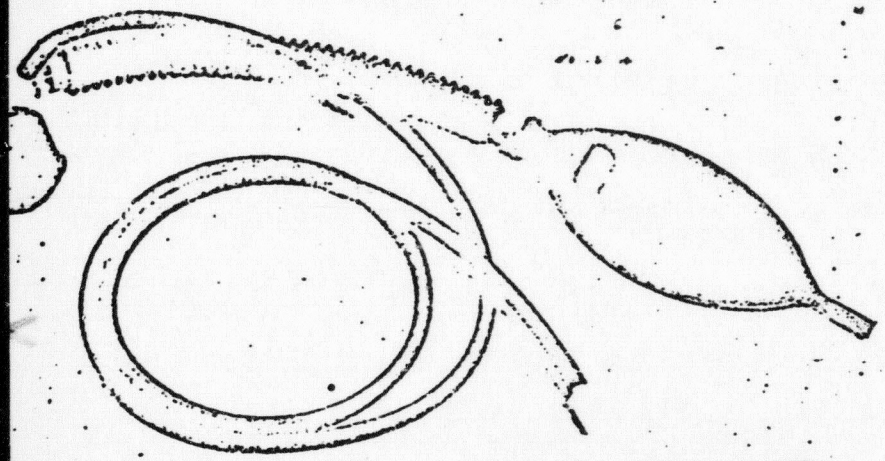


A 4460

The Boyle Model 50

CX-150-F





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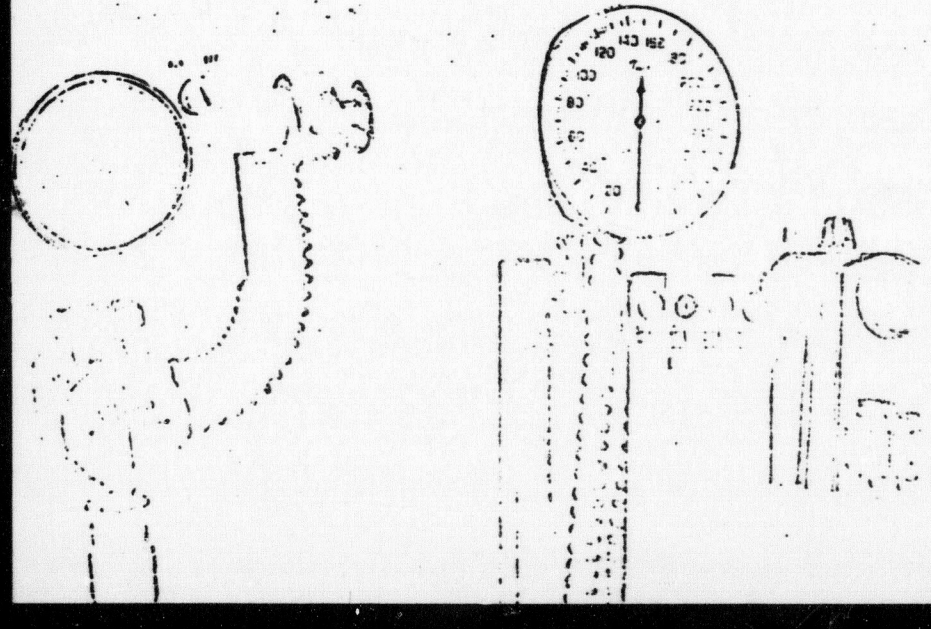


OPTIONAL EQUIPMENT

Open Circuit Breathing Kit—Magill
50-00011 (Complete) . . Ea. $37.50

Comprising:
51-00004 Neoprene Bagmount . . . . . Ea. $ 3.50
53-00012 Breathing Bag 2 Liter . . . . . Ea. $ 4.50
53-00060 Breathing Tube 36" . . . . . Ea. $ 7.00
51-00001 Adult Cone Hose Adapter 22mm . . . . . Ea. $ 2.50
51-00005 Expiratory Valve and Mount . . . . . Ea. $19.75
51-00006 Face Mask Elbow . . . . . Ea. $ 3.50

Mapleson Modified Ayres Technique . . .

. . . has an open ended bag in place of expiratory valve and a clear plastic face mask swivel elbow with removable plug cap for suctioning or manual resuscitation. Extension corrugated tube permits bag to be held clear of infant's head.

64-00301 . . . . . Ea. $34.50

Expiratory Valve (optional)
64-00307 . . . . . Ea. $10.50

6" Dial Aneroid Sphygmomanometer With Mounting Clamp

66-00151 . . . . . Ea. $67.50

Wright Respirometer—Large Dial Model . . . (left)

. . . is ideally suited for mounting on the absorber. One revolution of the large sweep hand records 1 liter, while the small hand of the inset dial records cumulatively to 100 liters. A specially designed by-pass attachment is available, enabling the unit to be quickly attached to the exhalation valve of an anesthetic circuit to measure the exhaled gases which would by-pass the unit, but, by turning the control knob, the gases can be directed through the respirometer.

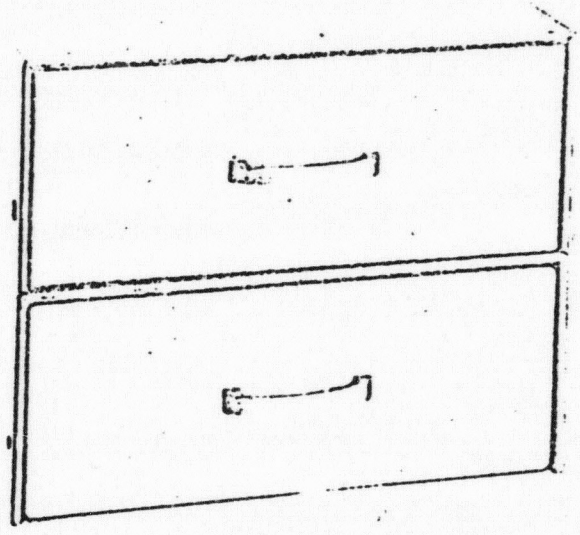
Large Dial Unit
66-00200 Ea. $350.00

By-Pass Attachment
66-00205 Ea. $ 25.00

A 4461

The Boyle Model 50

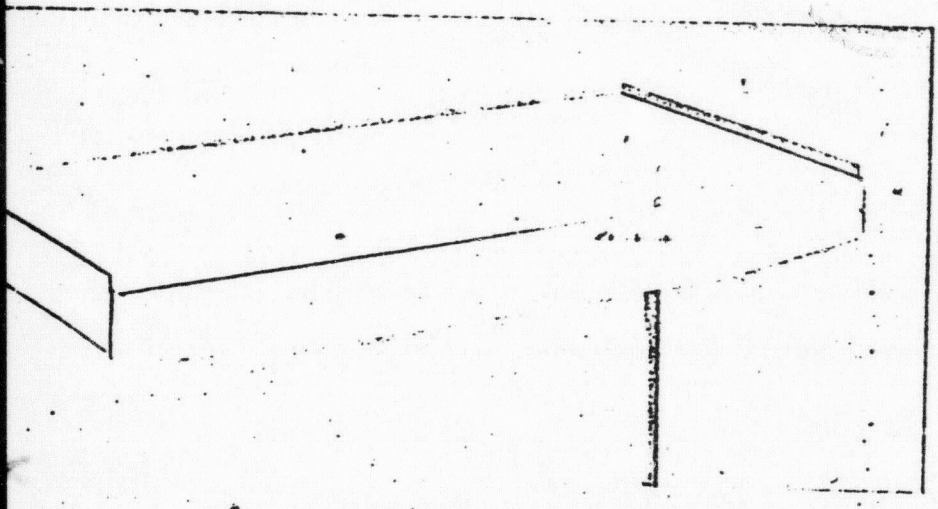
CX-150-G



OPTIONAL EQUIPMENT (Cont.)

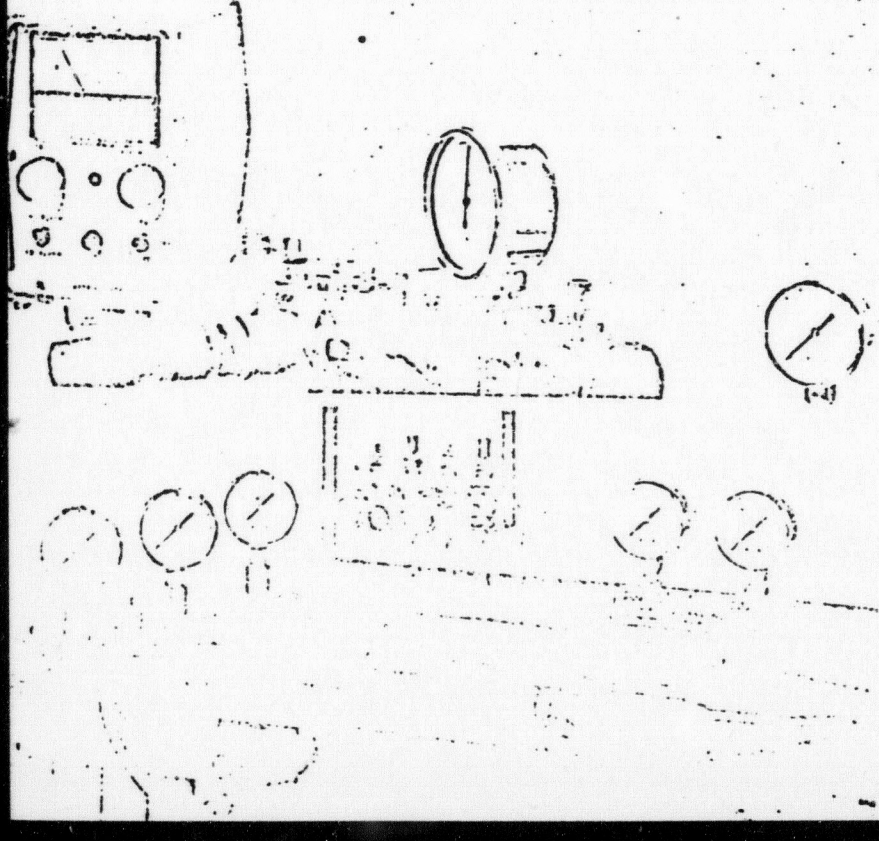
Stainless Steel Drawer Unit
Single drawer is standard equipment on all Boyle Model 50's. The table is designed to accommodate one or two additional drawer units as illustrated.

50-00002 . . . . . Ea. $59.50



Stainless Steel Shelf . . .
. . . suitable for monitoring equipment, designed to fit into the I. V. inserts of the back bar uprights with the shelf at the five-foot level. Will accommodate up to 75 lbs. weight.
Width . . . 23¼ inches
Depth . . . 12 inches

50-00022 . . . . . Ea. $87.50

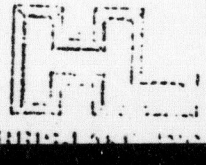


Harlake Oxygen Analyzer . . .
. . . has Female Port and Capped Circuit "T" for continuous monitoring of patient's inspired oxygen concentration. Can be mounted on the inspiratory side of the absorber or in a single tube breathing system.

66-00471 . . . . . Ea. $325.00

Cuff Inflation System—
Conductive

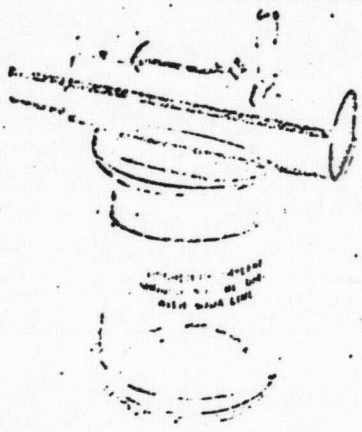
66-00154 . . . . . Ea. $23.00



A 4462 The Boyle EX-150-A

Model 50

VAPORIZERS—MISCELLANEOUS

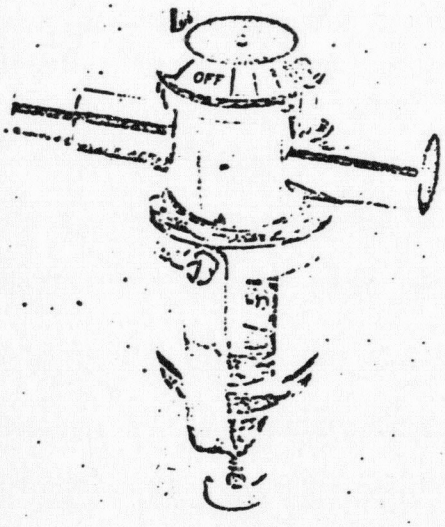


Rowbotham Trilene Vaporizer. . .
. . . designed for administering moderate concentrations of trichloroethylene, chloroform, or vinyl ether. Capacity 35 c.c.

63-00001 . . . . . Ea. $ 55.00
Replacement Jar
63-00002 . . . . . Ea. $ 4.75

Adapters . . .
. . . are required for using vaporizer with standard American equipment.

51-00009 Female Adapter
.913" . . . . . Ea. $ 5.40
51-00012 Male Adapter
.913" . . . . . Ea. $ 5.00

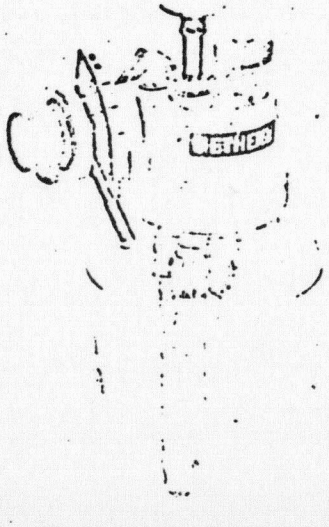


Goldman Halothane Vaporizer . . .
. . . limits Halothane concentration to 3.0% by volume, irrespective of gas flow. Vaporizer is also suitable for use with trichloroethylene in low concentrations.

63-00011 . . . . . Ea. $104.00
Replacement Jar
63-00012 . . . . . Ea. $ 6.50

Adapters . . .
. . . required for use with standard American equipment.

51-00009 Female Adapter
.913" . . . . . Ea. $ 5.40
51-00012 Male Adapter
.913" . . . . . Ea. $ 5.00



Boyle Ether Vaporizer . . .
is designed to provide high vapor strength by bubbling gases through ether, and a flexibility of control by the combined use of the by-pass lever and plunger controls.

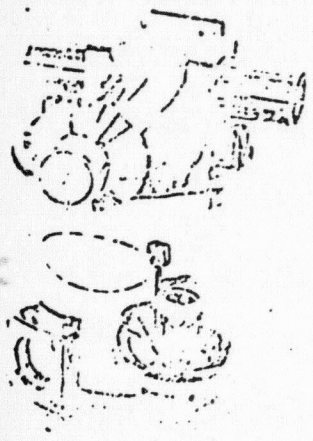
63-00021 . . . . . Ea. $ 85.00
Replacement Jar
63-00022 . . . . . Ea. $ 4.75

Percentages by Volume Diethyl Ether at 20° C and 7 LPM Gas Flow			
Position of Plunger Relative to Liquid Surface			
Lever Position	30mm Above	10mm Above	10mm Below
1	Nil	Nil	Nil
2	1.8	3.7	Nil
3	9.1	11.0	Nil
4	19.6	22.0	32.5

A 4463

The Boyle Model 50

EX-150-I



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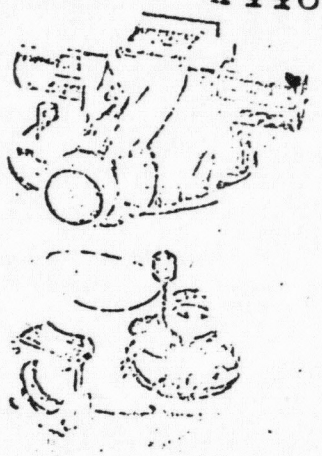
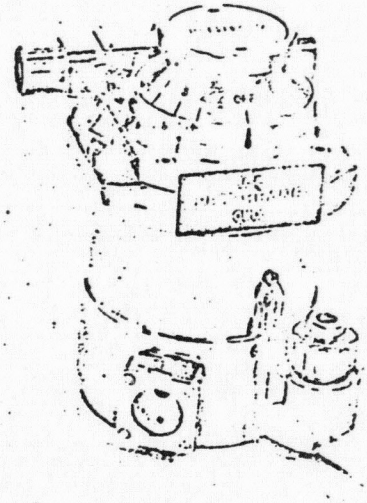


B

C



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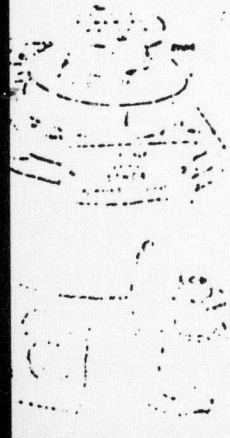
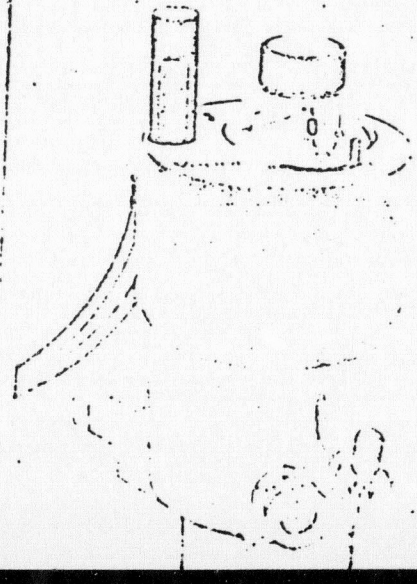




COMPENSATED VAPORIZERS

A
Fluotec® Halothane Vaporizer Mk. 2
0.5% to 4% at ½% intervals
63-00101 (Less pin-safety) ..... Ea. $300.00
63-00102 (with pin-safety) ..... Ea. $360.00

B
Pentec® Methoxyflurane Vaporizer Mk. 1
0.5% to 4% at ½% intervals
63-00251 (Less pin-safety) ..... Ea. $300.00
63-00252 (with pin-safety) ..... Ea. $360.00

C
Fluotec® Halothane Vaporizer Mk. 3
0.5% to 5% at ½% intervals
63-00201 (Less pin-safety) ..... Ea. $320.00
63-00202 (with pin-safety) ..... Ea. $380.00

D
Pentec® Methoxyflurane Vaporizer Mk. 2
0.35% to 2% at ½% intervals
63-00301 (Less pin-safety) ..... Ea. $320.00
63-00302 (with pin-safety) ..... Ea. $380.00

E
Ethertec® Compensated Ether Vaporizer
Range 0-20%
63-00404 ..... Ea. $320.00

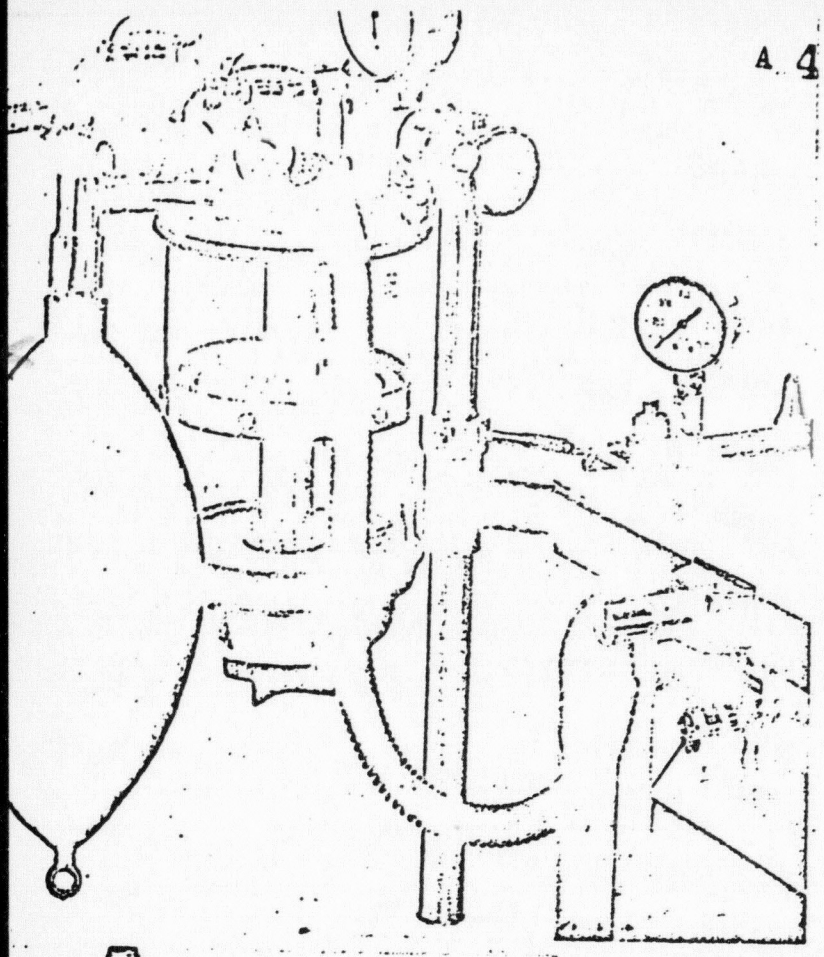
F
Drager "Vapor"® Vaporizers . . .
. . . deliver accurate and constant concentrations according to dial settings at flow rates from 300 CCS to 12 L.P.M.
63-00402 Halothane "Vapor" ..... Ea. $395.00
63-00403 Methoxyflurane "Vapor" ..... Ea. $395.00

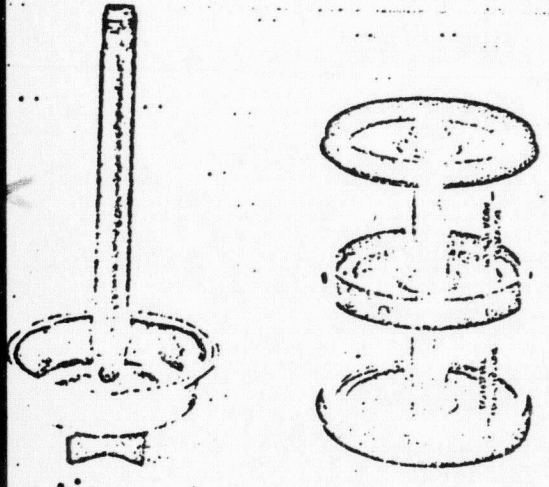
HARRIS LABS, INC.
Manufacturers of [illegible]

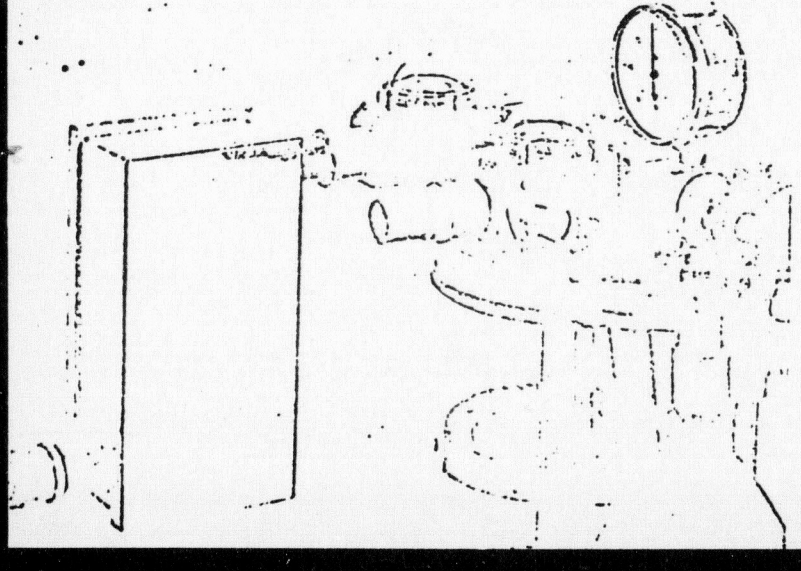
A 4464

The Boyle Model 50

CX-150-I







Boyle Mark 3 Carbon Dioxide Absorber

Combines high absorption efficiency with long soda-lime life.

The absorber head has low resistance uni-directional valves, manometer, adjustable spill valve, swivel bag-mount, and circuit control valve.

The circle control valve enables the soda-lime cannister to be by-passed allowing carbon dioxide re-breathing, if indicated, and allowing the cannister to be changed without interruption of anesthesia.

Cannister Assembly . . .

. . . has a 4 lb. capacity and is divided centrally by a perforated baffle, eliminating channeling. It is attached to the absorber head by a center tube connected to a moisture trap. The exhaled gases pass down the tube, then upward through the soda lime, the lime in the LOWER cannister being the first to become exhausted.

Absorber With Rubber and "Y" Piece
50-00051 . . . . . Ea. $390.00

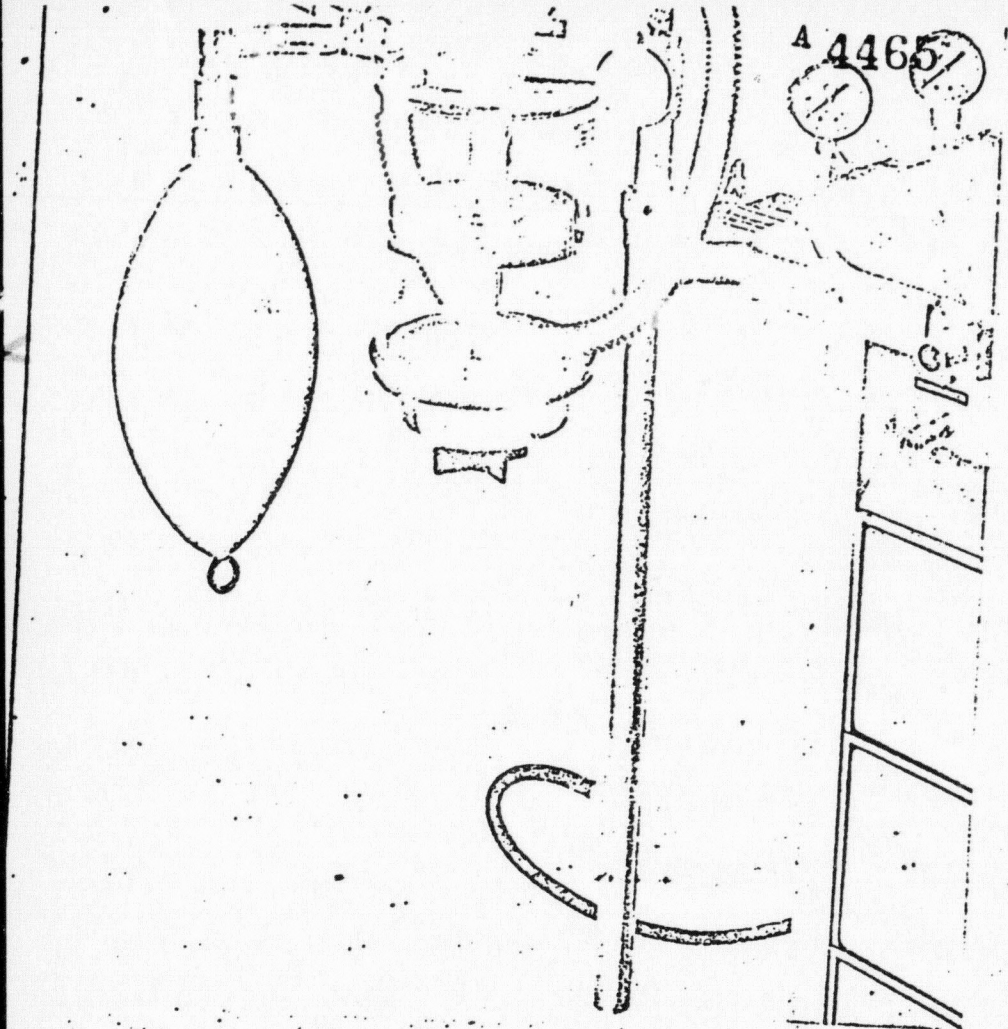
Absorber Less Rubber and "Y" Piece
50-00052 . . . . . Ea. $360.00

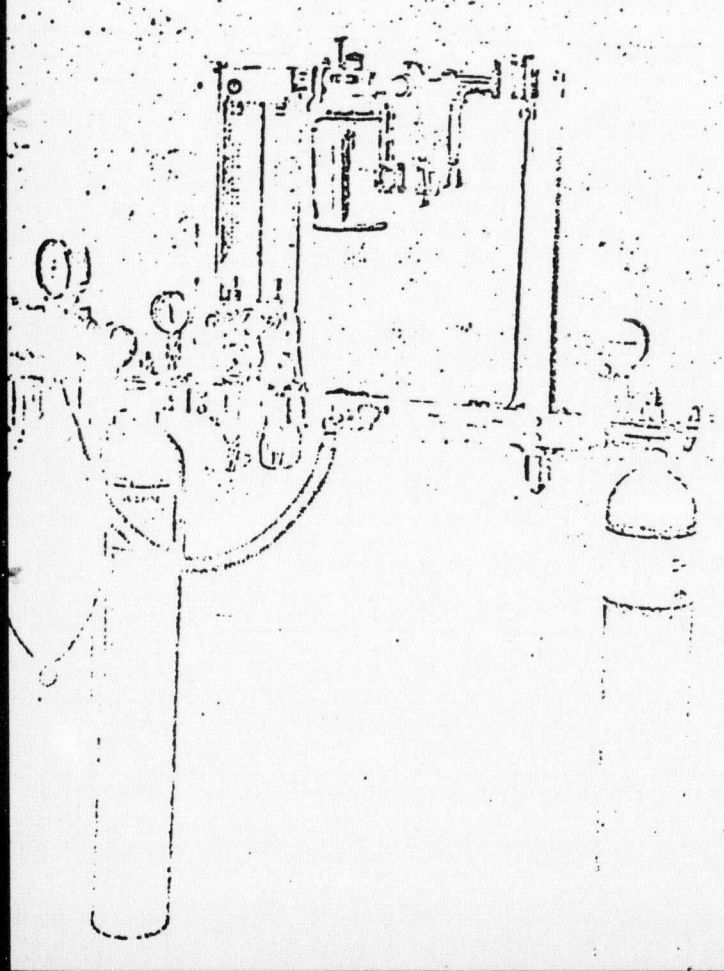
Anesthesia Bacteria Filter . .
. . . when attached to the expiratory side of the absorber, provides effective bacteriological protection against contamination of the equipment. (See page 20 for more detailed information.)

59-00001 . . . . . Ea. $130.00

In addition, the Wright Respirometer with by-pass attachment and the Oxygen Analyzer with "T" adapter listed on page 7 are designed for direct attachment to the Boyle Absorber Mark 3.

A 4465





The Boyle Model 50

EX-150-K

Harlake Gas Evacuator . . .

. . . designed to exhaust excess non-flammable anesthetic gases into a central vacuum system or divert vapors and gases to floor level for ultimate dispersal through normal atmospheric exchange. The necessity of using an additional gas collection tube is obviated, as the absorber upright is used for this purpose. The kit comprises a scavenger ring for attachment to the absorber relief valve, a replacement tubing mount cap for the absorber mounting upright and a connecting corrugated hose assembly. The lower retaining cap of the upright is replaced with an open ended extension tube incorporating a restricted suction tube outlet obviating the need for controlled suction as a power source. On earlier Model Boyle absorbers it will also be necessary to change the absorber relief valve.

96-03183 Gas Evacuator — Complete . . . . . Ea. $37.50

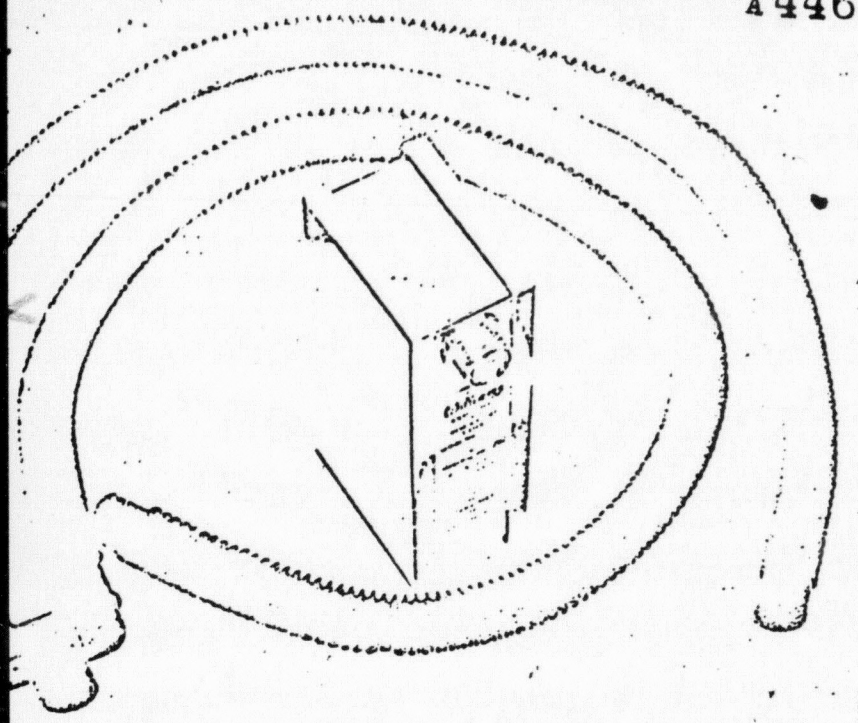
96-02760 Relief Valve Assembly (Optional) . . . . Ea. $15.00

The Wall Mounted Boyle . . .

. . . designed specifically for areas where space is at a premium. Normal usage is with piped gas supplies, but in 3 gas units a cyclopropane yoke is fitted to the wall bracket assembly. Provision for cylinder oxygen can be made on 3 gas units. Functionally, the Wall Mounted Boyle is as complete an anesthesia machine as the Boyle Mode 50, accommodating one or two inline vaporizers and a circle absorber. With the exception of drawer units and monitoring equipment shelf, all the optional equipment available for the Boyle 50 range is suitable for use with the Wall Mounted Boyle.

The Wall Mounted Boyle — Basic Units Less Vaporizers		
Model No.	Description	Price
50-01300	2 Gas, Pipeline Unit for O_2 and N_2O	$
50-01222	2 Gas, 2 Yoke, Pipeline Unit for O_2 and N_2O	$
50-01312	3 Gas, 1 Yoke, Pipeline Unit for $O_2/N_2O/C_3H_6$	$
50-01322	3 Gas, 2 Yoke, Pipeline Unit	$135.00

A 4466



Single-Use Breathing Circuits... Masks and Bags

EX 150-L

Harlake Single-use Breathing Circuit...
...comprises two 30" flexible lightweight conductive breathing tubes and a swivel Y-Piece of standard dimensions. Also available is a single-use conductive breathing bag and a multi-fitting facemask.
The breathing tubes are conductive ethylene vinyl acetate (E.V.A.) which has an extremely low uptake of anesthetic agents such as halothane and methoxyflurane.
Harris-Lake supports the fact that disposable breathing circuits in themselves do not provide adequate patient protection unless they are used in conjunction with an efficient bacteria filter*. With every order for 200 sets of the basic Harlake disposable breathing circuits we will supply at no extra cost a Williams Bacteria Filter.

The Williams Filter can be placed on the exhalation side of the circle absorber and if autoclaved or gas sterilized daily should provide bacteria protection down to 0.5 micron size for upwards of 13 months. In this position the absorber breathing bag would be on the downstream side of the filter and would not require replacing with each single-use breathing circuit. (Fig. 1) If the filter is located on the inspiratory side of the absorber a single-use breathing bag should be used with each basic breathing circuit. (Fig. 2)

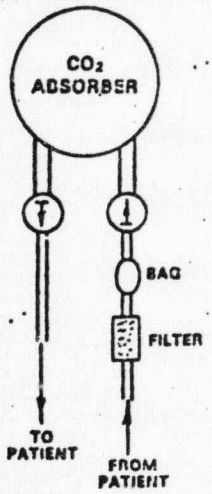


FIG.1

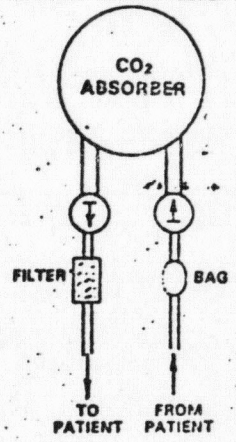


FIG.2

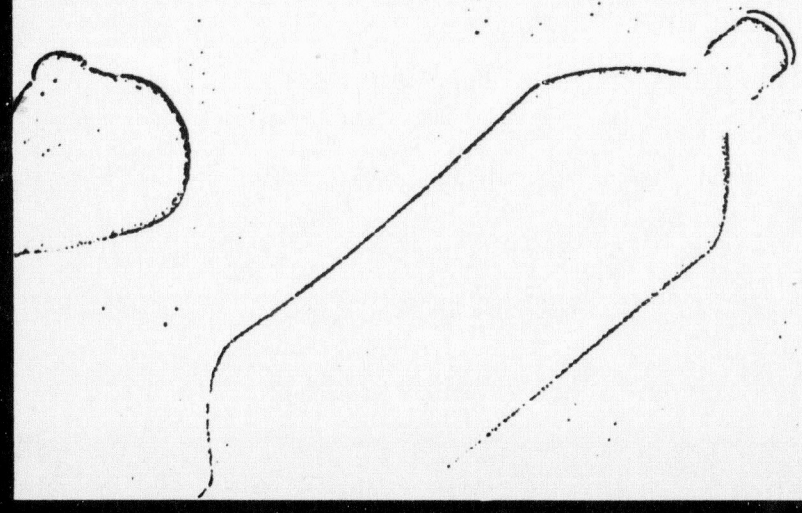
53-00070 Basic Circuit (2 Tubes and Swivel Y-Piece)
10-190 Circuits ..... Ea. $2.45
200 Circuits (With Williams Bacteria Filter) ..... Ea. $2.45

Facemask of conductive E.V.A. ...is the rolled flange type incorporating a concertina body configuration providing a cushioned fit on various face sizes. A supply of five prong conductive plastic hook-rings is included with each box of masks.

53-00071 Boxes of 25 Masks and 10 hook-rings ..... per box $17.50

Breathing Bag...

53-00072 Single-Use Bag
3 Liter, 10-99 Units ..... Ea. $ .90
100-199 Units ..... Ea. .85
200 and over ..... Ea. .75

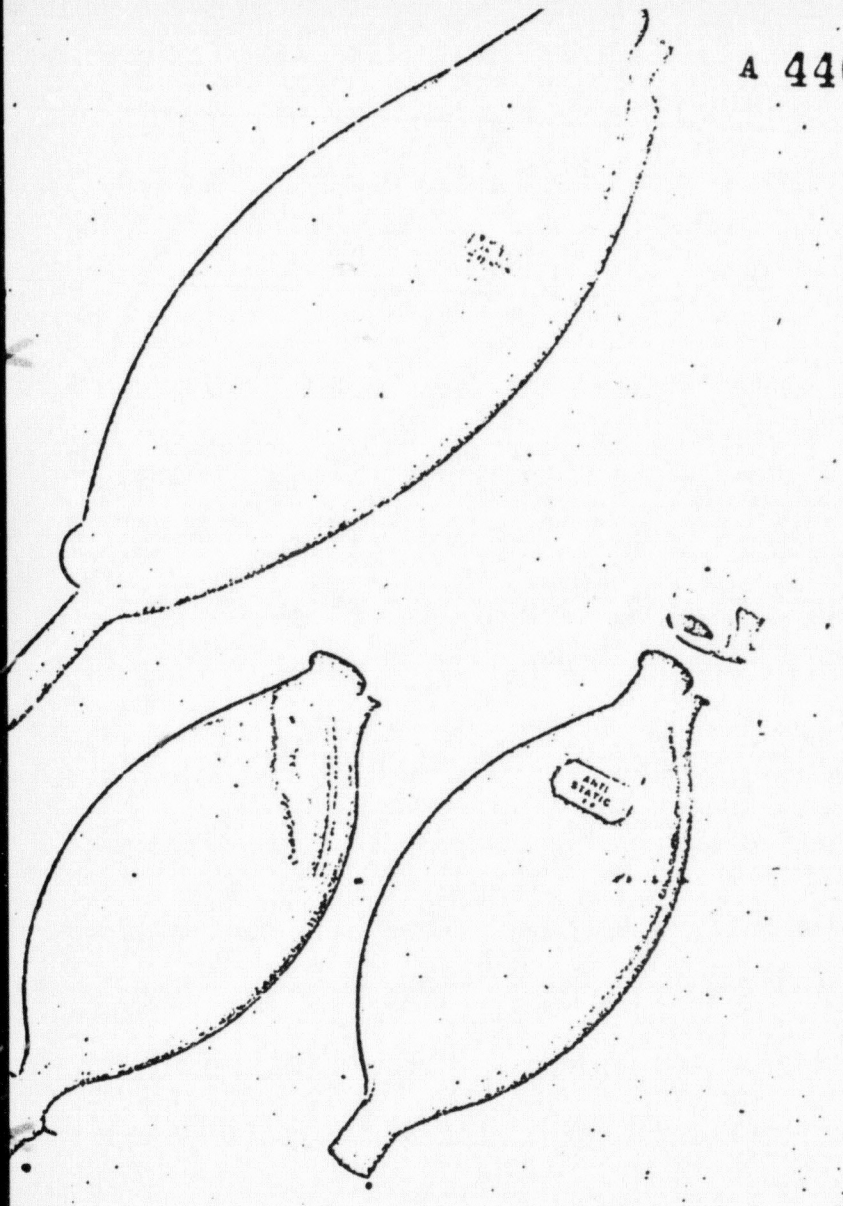


"Prevention of Contamination of the Circle System and Ventilators With a New Disposable Filter" — Gleam V. Salanitro, B.S. et al. Anesthesia and Analgesia Vol. 50, #5, Sept./Oct., 1971

A 4467

Breathing Bags and Tubes

EX-150-M



Harlake Conductive Breathing Bags . . .
. . . are of the new longer shape to facilitate manual respiration. Incorporate ⅞" internal bushing and sealed bag-tail. They are designed for single or double ended use. Available in five sizes.

53-00011	1 Liter	Ea. $ 4.00
53-00012	2 Liter	Ea. $ 4.50
53-00013	3 Liter	Ea. $ 4.75
53-00014	4 Liter	Ea. $ 5.00
53-00015	5 Liter	Ea. $ 5.50

Harlake Pediatric Bags . . .
. . . manufactured from thin-wall conductive latex to provide sensitivity in assisted breathing techniques. Incorporate roll-neck, open bag-tail and plug. Also available with tap in place of plug. Particularly suitable for use with Mapleson "A" circuit.

53-00001	Bag with tap, ½ liter	Ea. $ 5.25
53-00002	Bag with plug ½ liter	Ea. $ 4.25
53-00005	Bag tap	Ea. $ 2.00
64-00303	Bag Adapter, Female 15mm	Ea. $ 3.75

Breathing Tube — Smooth . . .
. . . specifically designed for use with mechanical ventilators. Flexible, conductive neoprene reinforced with a nylon spiral. Smooth finish both internally and externally.

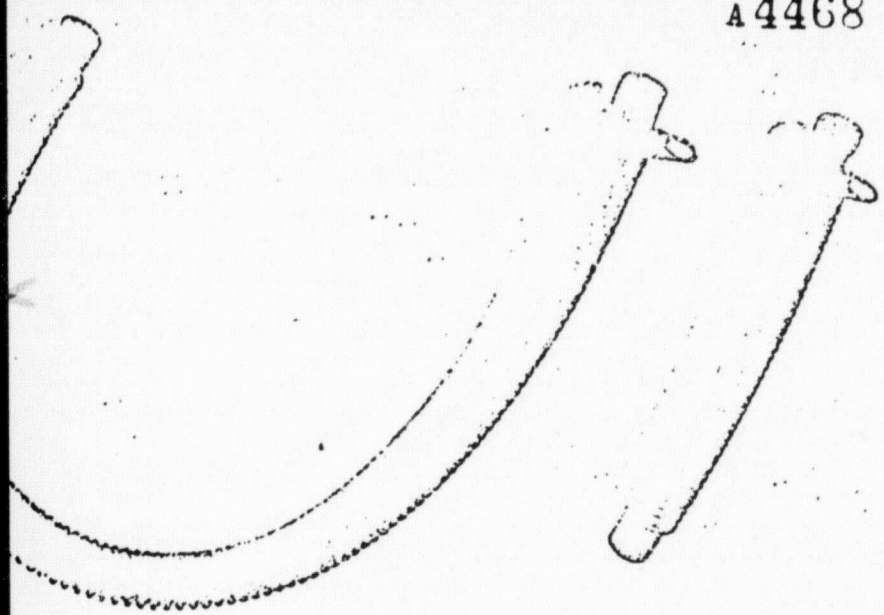
53-00064	42" Non-extendable	Ea. $16.50

HARRIS-LAKE, INC.
Manufacturers of Quality Medical Equipment

A4468

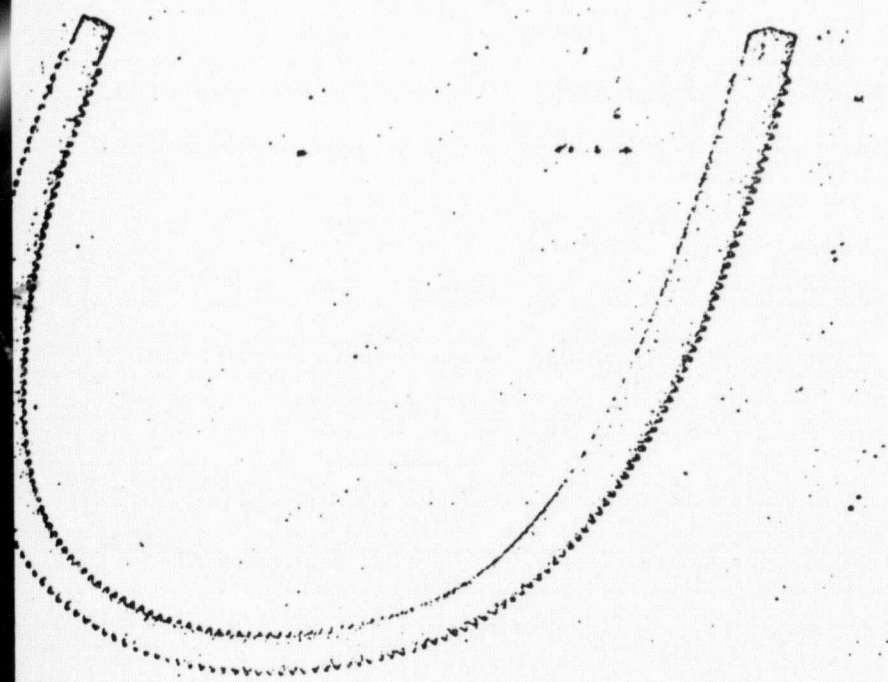
Breathing Tubes

CX-150-N



Harlake Corrugated Conductive Breathing Tube . . .
. . . extremely flexible lightweight corrugated hose made from conductive neoprene for long life.

53-00060 Length 36" . . . . . Ea. $7.2
53-00063 Length 12" . . . . . Ea. $4.1



Harlake Pediatric Conductive Breathing Tube . . .
. . . made from conductive neoprene, ⅝" in diameter, supplied in 39" lengths. These tubes are ideally suited for all pediatric applications. They may be cut to any suitable length and by using the available 15mm adapters designed to fit the first two corrugations at each end connect in any standard 15mm circuit.

53-00066 Length 39" . . . . . Ea. $3.3

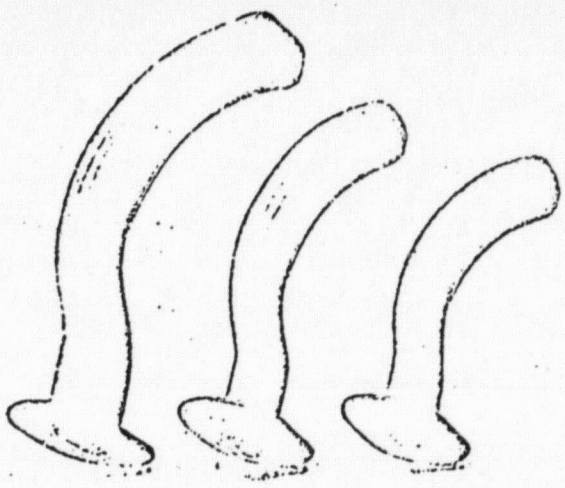
64-00303 Hose Adapter
Female 15mm . . . . . Ea. $3.75

64-00304 Hose Adapter
Male 15mm . . . . . Ea. $3.7

A 4469

Airways

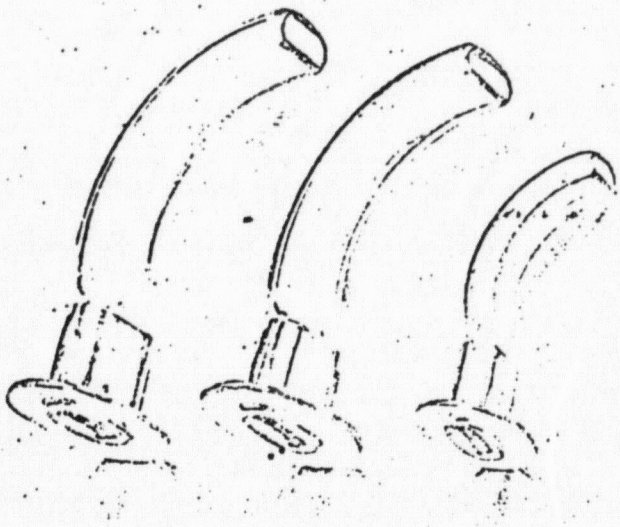
EX-150-O



Guedel Airway . . .

. . . is an anatomically shaped, molded conductive neoprene airway with metal insert for extra rigidity between the teeth.

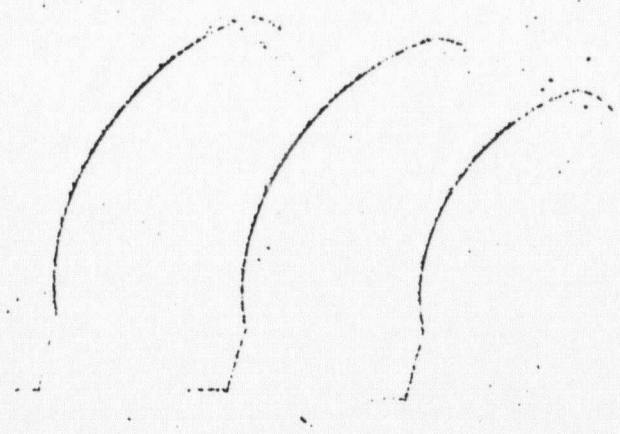
52-00001	Size	00	47mm	
52-00002	Size	0	56mm	
52-00003	Size	1	70mm	Ea. $1.60
52-00004	Size	2	80mm	
52-00005	Size	3	98mm	
52-00006	Size	4	115mm	



Plastic Guedel Airway . . .

. . . is molded in transparent polyvinyl chloride and fitted with metal insert. Free of taste or irritation to the oropharyngeal mucosa. Will withstand repeated sterilization by boiling.

52-00011	Size	000	37mm	
52-00012	Size	00	47mm	
52-00013	Size	0	56mm	
52-00014	Size	1	70mm	Ea. $2.25
52-00015	Size	2	80mm	
52-00016	Size	3	98mm	
52-00017	Size	4	115mm	



Castaway™ Disposable Plastic Airway . . .

. . . is molded from non-toxic surgical grade EVA incorporating a non-collapsible bite block. Individually packed and sterilized in cartons of 50 airways of the same size.

52-00021	Size	1	70mm	Box of 50 airways $25.00
52-00022	Size	2	90mm	
52-00023	Size	3	105mm	
52-00024	Size	4	110mm	

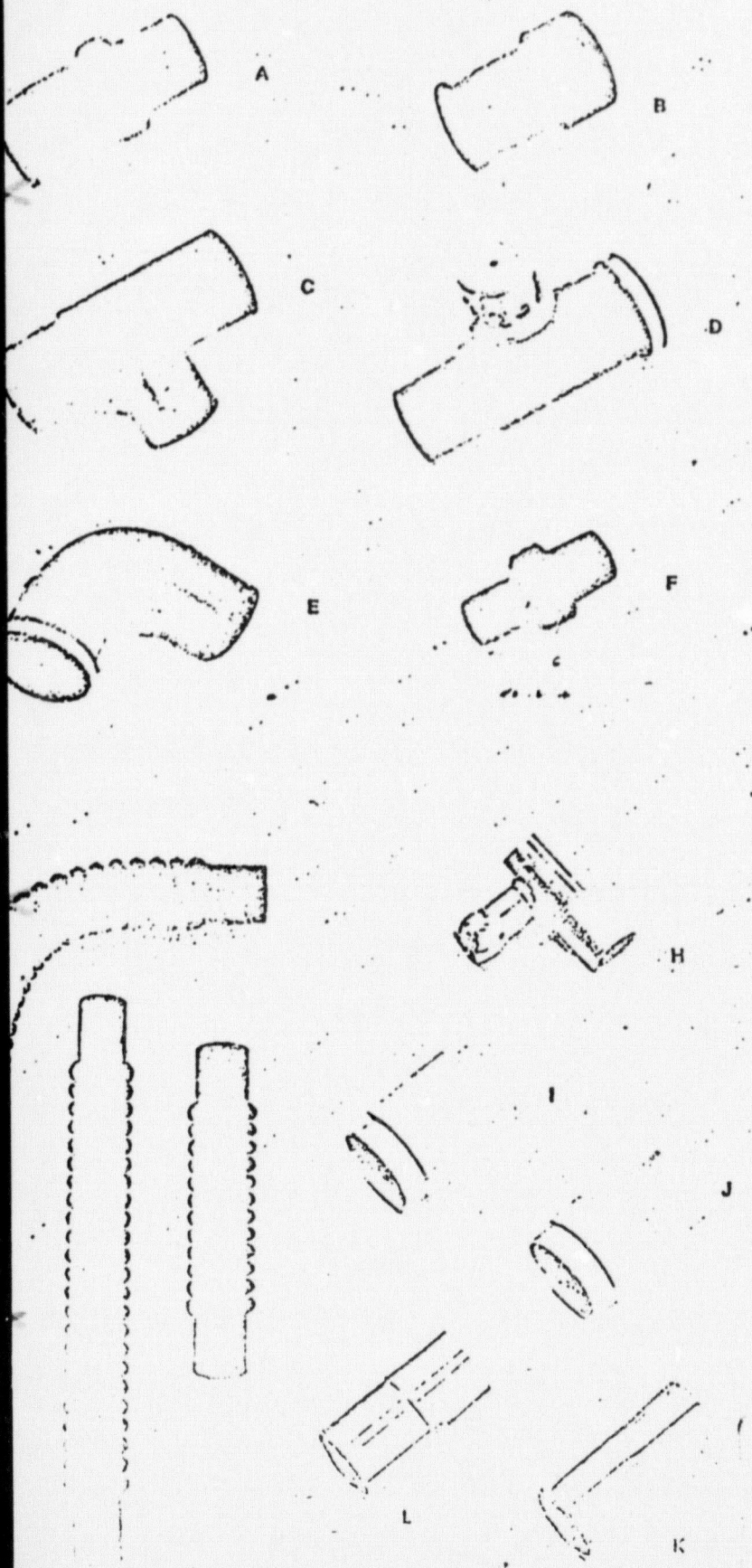
HARRIS-LAKE, INC.

Manufacturers of Lakeside Medical Equipment

A 4470

Adapters/Valves and Mounts

EX-150-P



ADAPTERS, EXPIRATORY VALVES AND MOUNTS . . .

. . . are manufactured in hard, conductive neoprene, for standard 22mm/15mm breathing circuits.

A Adult Cone Hose Adapter
51-00001 Male 22mm . . . . Ea. $2.50

B Adult Socket Hose Adapter
51-00002 Female 22mm . . . Ea. $2.50

C Bagmount "T"
51-00004 Inlet 22mm-Female
Bag fitting and outlet
22mm-Male . . . . . Ea. $3.50

D Expiratory Valve Mount
51-00005 Inlet 22mm-Female
Outlet 22mm-Male . . . . . Ea. $19.75

E Facemask Elbow
51-00006 Inlet 22mm-Female
Outlet 22mm-Male . . . . . Ea. $3.50
Used as a mating part to Expiratory Valve Mount 51-00005

F Pediatric Hose Adapter
51-00007 Male 15mm . . . . . Ea. $2.50

G CORRUGATED CONNECTING TUBES
52-00031 3½" length . . . . . Ea. $1.75
52-00032 5" length . . . . . Ea. $2.50
52-00033 9" length . . . . . Ea. $3.25

METAL ADAPTERS AND CONNECTING PIECES

H Angled Tube Connector
51-00008 15mm Male . . . . . Ea. $5.75

I-J Adapters . . .
. . . commonly used to connect Wright Respirometers to standard breathing circuits.

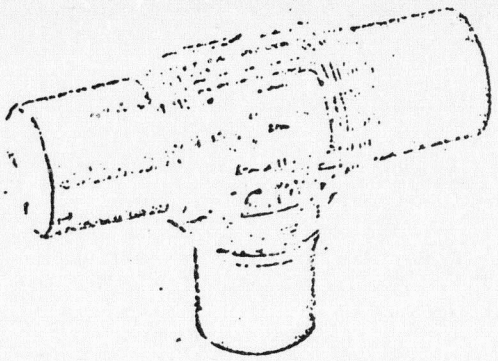
I 51-00009 Double Female 22mm to .913" (British) . . . . . Ea. $3.40

J 51-00010 Male 22mm to Female .913" (British) . . . Ea. $3.40

K Equal Adapter
51-00011 Male 22mm . . . . . Ea. $3.00

L Adapter Male British
51-00012 22mm to .913" . . . Ea. $3.50

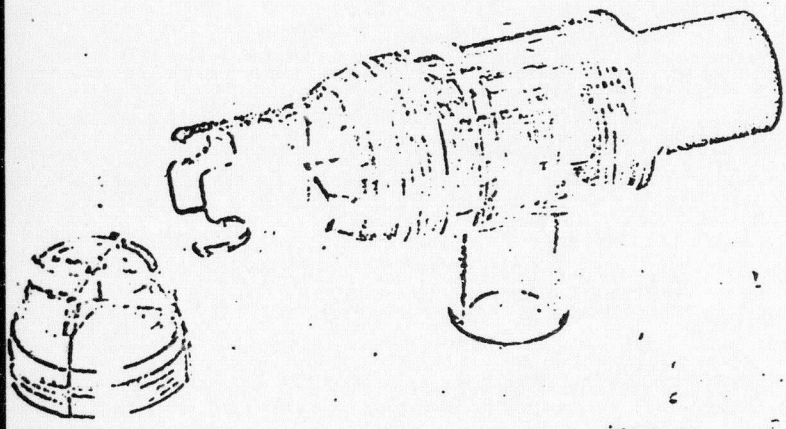
A 4471 Adapters/Valves and Mounts



Ruben Non-Rebreathing Valve . . .

. . . is clear plastic, reliable, easily cleaned. The non rebreathing technique assures the anesthesiologist that the percentage composition of the gas mixture inhaled is identical with that delivered by the anesthetic machine.

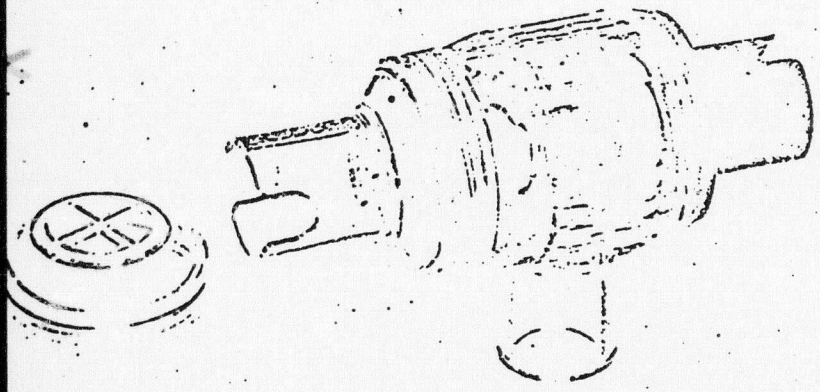
51-00071 . . . . . Ea. $52.00



Ambu 'E' Valve . . .

. . . is a non-rebreathing valve for anesthesia and resuscitation. Unbreakable, non-corroding, non-sticking, no leak-back. Incorporates silicone rubber membrane valves. Easily dismantled for cleaning and cannot be re-assembled incorrectly.

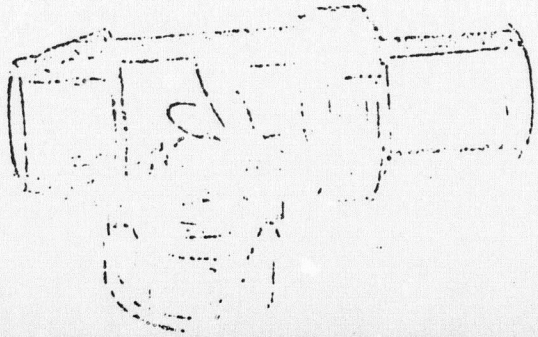
51-00076 . . . . . Ea. $39.50



Ambu Hesse Valve . . .

. . . is a similar but slightly larger version of the AMBU E-Valve designed for use where extremely low resistance is indicated. Inspiratory resistance 0.5cm of water, expiratory resistance 0.75cm water at 30 L.P.M. flow.

51-00077 . . . . . Ea. $42.50



Positive Pressure Valve (Lewis-Leigh) . . .

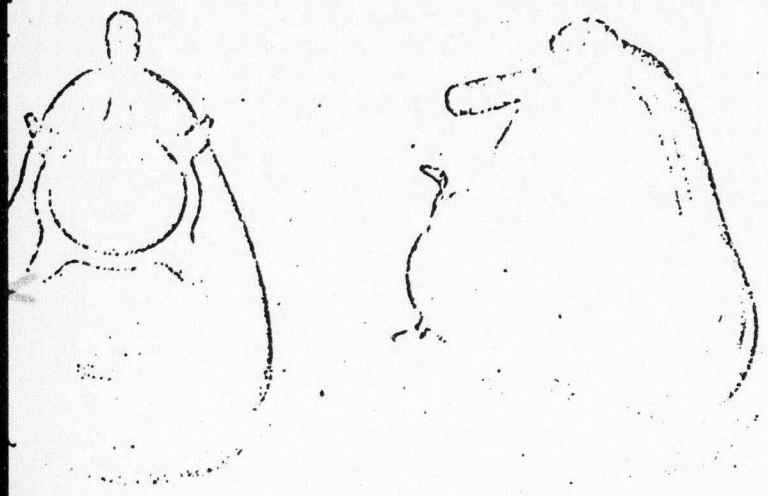
. . . operates as a conventional non-rebreathing valve during spontaneous breathing. Exhalation valve closes automatically when breathing bag is squeezed. Made in clear polycarbonate Can be sterilized by all conventional methods.

51-00078 . . . . . Ea. $19.50

HARRIS-LAKE, INC.

A 4472 Facemasks and Headstraps Conductive

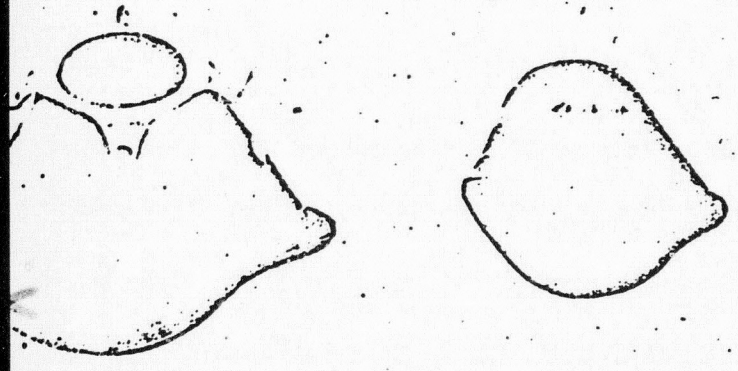
CX-150-R



Harlake Conductive Anatomical Facemasks . . .

. . . are neoprene dipped conductive latex masks, anatomical in design throughout the whole size range. Body is completely malleable and the face cushion has no visible crevice where debris and bacteria may be trapped. Fitted with ⅞" internal bush and universal 5-prong hook-ring.

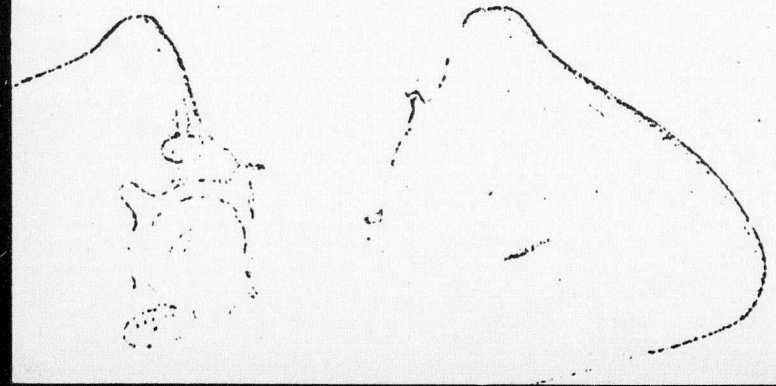
54-00020 . . Size 0 Infant
54-00021 . . Size 1 Infant
54-00022 . . Size 2 Child
54-00023 . . Size 3 Small — Ea. $9.50
54-00024 . . Size 4 Medium
54-00025 . . Size 5 Large
54-00026 . . Size 6 Extra Large



Rendell-Baker-Soucek Pediatric Facemasks . . .

. . . were devised from a series of molds taken from a number of infants faces in order to determine the correct average contour. Designed to provide an overall tight seal with a minimum of dead space. The mask bushing is 22mm (⅞") allowing use with adult size fittings.

54-00010 . . Size 0
54-00011 . . Size 1 — Ea. $6.50
54-00012 . . Size 2
54-00013 . . Size 3 (With Hook Ring)



'Flotex' Multi-Fitting Facemask . . .

. . . is designed to pick up under the chin and incorporates an inner sealing flange. Conforms closely to facial contours thus greatly reducing dead-space. Extremely useful in I.P.P.B. Therapy obviating leaks often present with conventional masks.

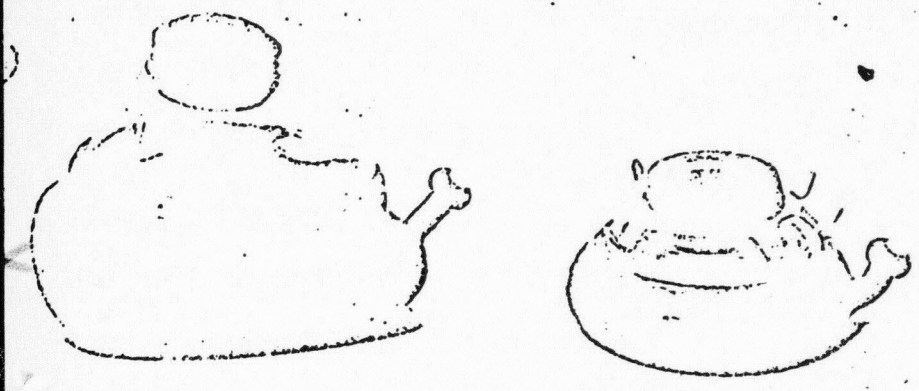
Ref. Rex Binning "Anaesthesia" Vol. 20, No. 4, Oct. 1965. Available in one size (Medium) only.

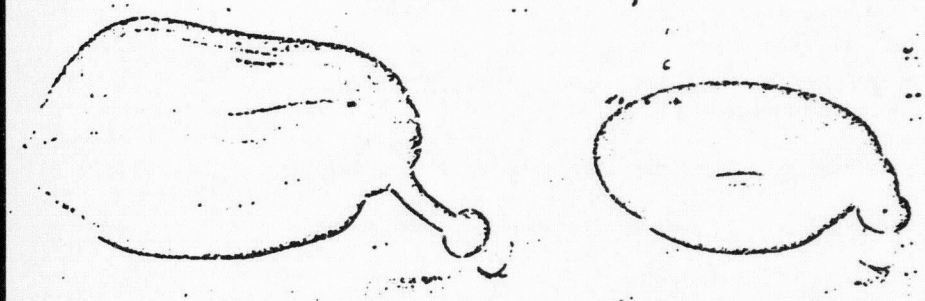
54-00003 . . . . . Ea. $9.50

A 4473

Facemasks and Headstraps

EX-150-S





Ambu® Transparent Facemask . . .

. . . incorporates convenient thumb support in facemask body. Facemask cushion is detachable and replaceable.

With Hook-Ring

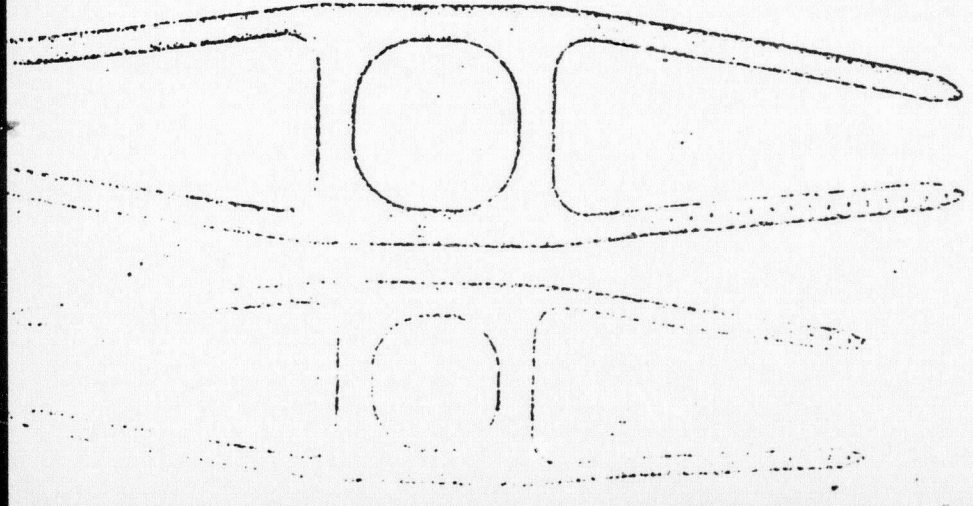
54-00050	. . . Infant Size 0	
54-00052	. . . Child Size 2	Ea. $10.5
54-00055	. . . Adult Size 5	

Less Hook-Ring

54-00060	. . . Infant Size 0	
54-00062	. . . Child Size 2	Ea. $10.2
54-00065	. . . Adult Size 5	

Replacement Face Cushions

54-00150	. . . Infant Size 0	
54-00152	. . . Child Size 2	Ea. $ 5.25
54-00155	. . . Adult Size 5	



Conductive Headstraps . . .

. . . are made from reinforced elasticized conductive rubber sheeting. Long lasting.

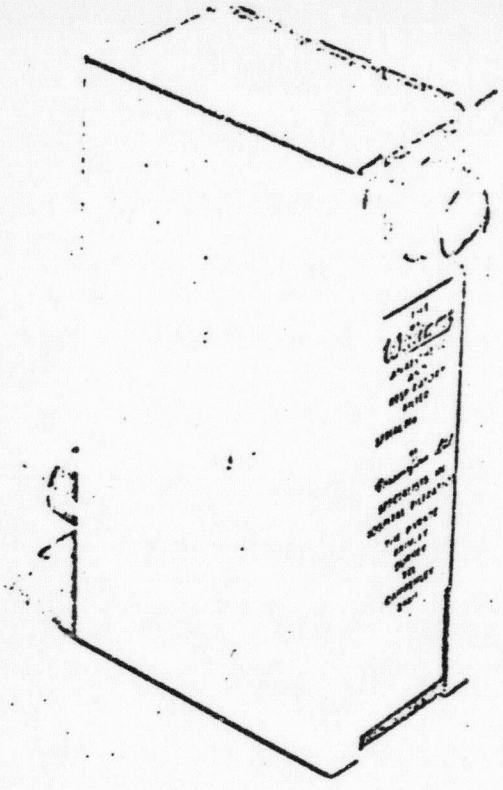
52-00061	. . . . . Small	
52-00062	. . . . . Medium	Ea. $ 5.2
52-00063	. . . . . Large	

HARRIS-LAKE, Inc.

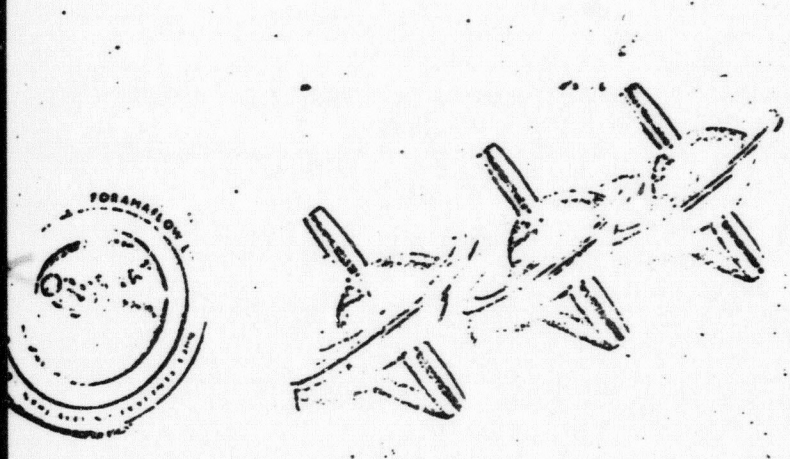
A4474

Bacteria Filters
Vapor Condensers

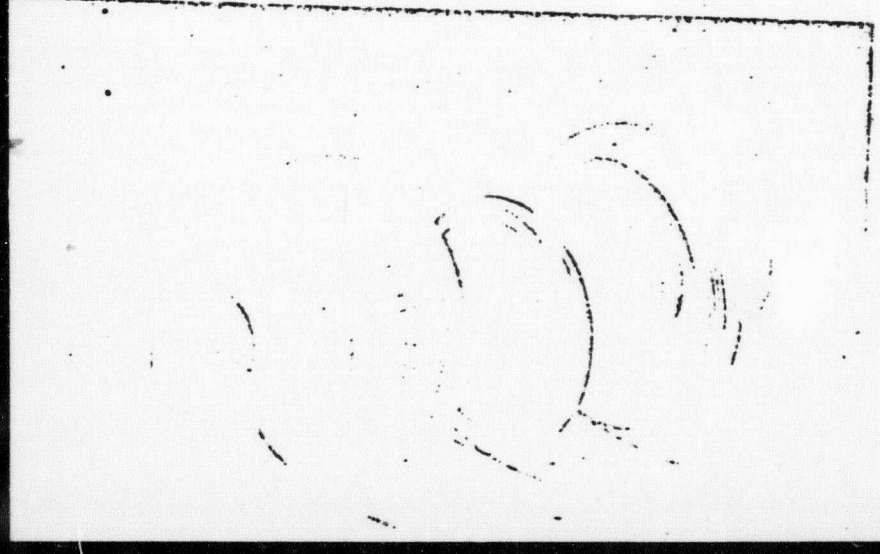
2X-150-T



Williams Anesthetic Bacteria Filter . . .
. . . provides effective bacteriological protection for ventilators and anesthetic gas machines. Attached to the inspiratory side of breathing apparatus it effectively sterilizes the inspiratory air or gas. Eliminates the risk of airborne contaminants.
Fitted to the expiratory side, the filter has a similar function, preventing bacteriological contamination of the apparatus by the patient.
Each unit is tested to ensure retention of particles greater than 0.5 microns. The effective life of the filter is 18 months after which time it should be discarded.
The unit should be sterilized by high speed autoclaving, daily. Collected moisture will be removed by this process. Alternatively it may be gas sterilized by ethylene oxide. (Ref. J. Hellewell Et. Al. "Anaesthesia" Vol. 22, 3, July 1967.)
59-00001 . . . . . Ea. $130.00



Gas Line Bacteria Filter . . .
. . . copes with an air/gas flow of 12 L.P.M. and will remove particulate matter down to 0.03 microns, an efficiency expressed as 0.001% penetration against the sodium chloride flame test. The gas line filter has many applications in the medical, pharmaceutical and laboratory fields. When fitted to the exhaust port of portable suction units it will effectively prevent bacteriological contamination of the surrounding environment. The unit is also indispensable to heart-lung and open-heart apparatus ensuring a satisfactory degree of sterility to gas and carbon dioxide air displacement lines. Packaged 4 filter units to a box.
59-00011 . . . . . Box $48.00

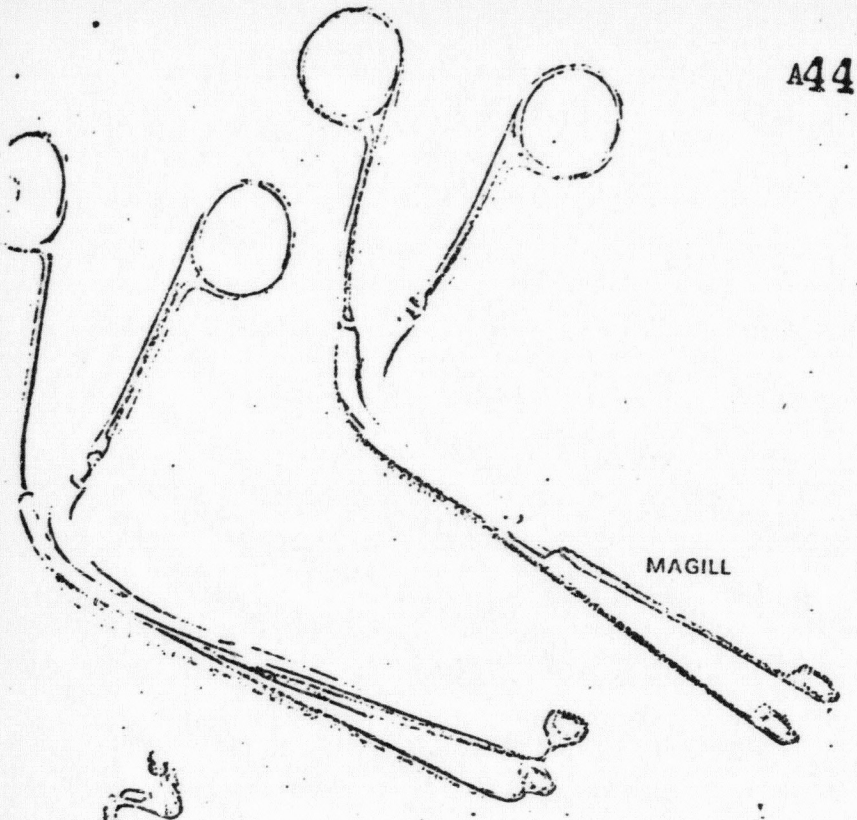


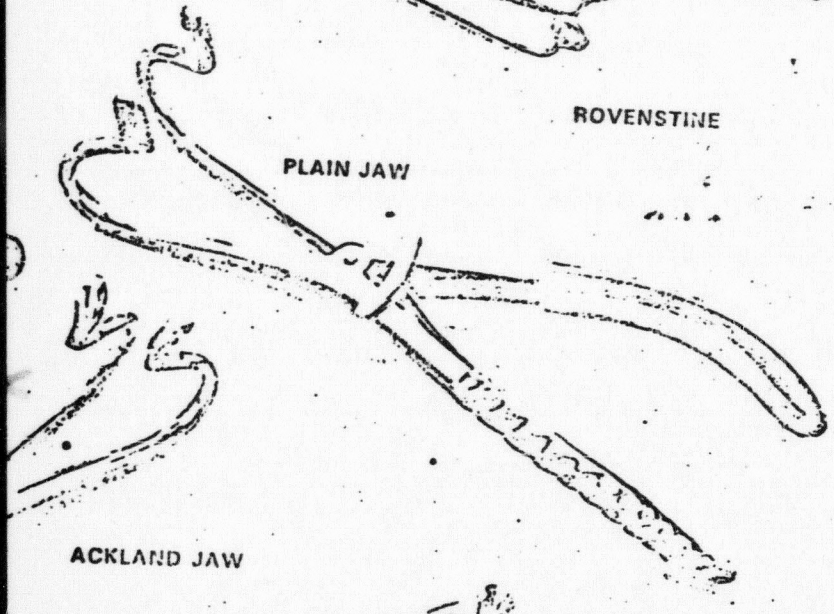
Garthur Vapor Condenser . . .
. . . an advanced type of heat-and-moisture exchanger, heating and fully humidifying the inspiratory air or gas. Eliminates the need of external sources of water, heat or power supply. Standard taper fittings.
Lightweight (2 ounces), minimum dead space (17ml), minimum resistance (0.1cm water at 30 L.P.M.)

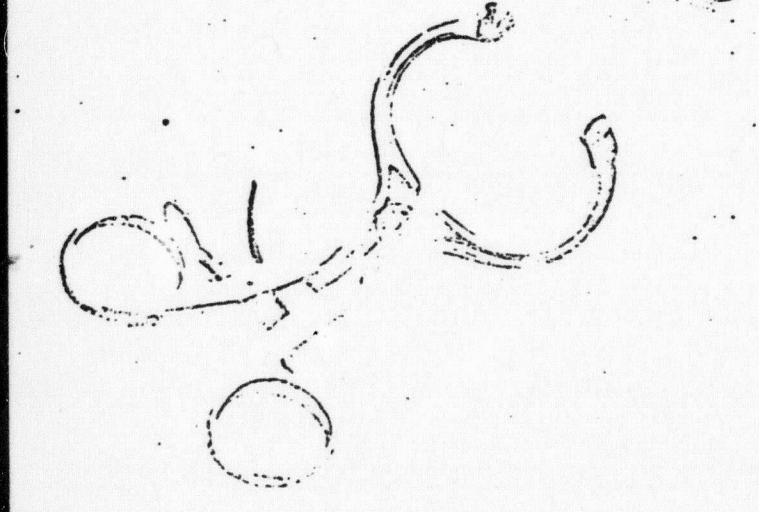
52-00081 (With 6 Condenser Elements) $3.50
52-00082 (With 2 Condenser Elements) $3.50
52-00083 (Single Disposable Element) $2.75

A4475

Introducing Forceps Mouth Gags







Introducing Forceps . . .

. . . are designed to facilitate the insertion of endotracheal tubes under direct vision. The handles are curved to prevent obstruction of view by the operator's hand. These forceps are hand crafted from forged stainless steel.

60-00011	Magill Forceps	Child
60-00012		Adult
60-00013	Rovenstine	Child
60-00014		Adult

Ea. $10.00

Ferguson Gags . . .

. . . are hand forged stainless steel incorporating efficient ratchet lock for one hand operation. Will not slip until pressure is applied to handle. Available in two jaw designs. Plain-parallel and Ackland-in line.

60-00001	Child, Plain Jaw
60-00002	Adult, Plain Jaw
60-00003	Child, Ackland Jaw
60-00004	Adult, Ackland Jaw

Ea. $22.50

Doyen Gag . . .

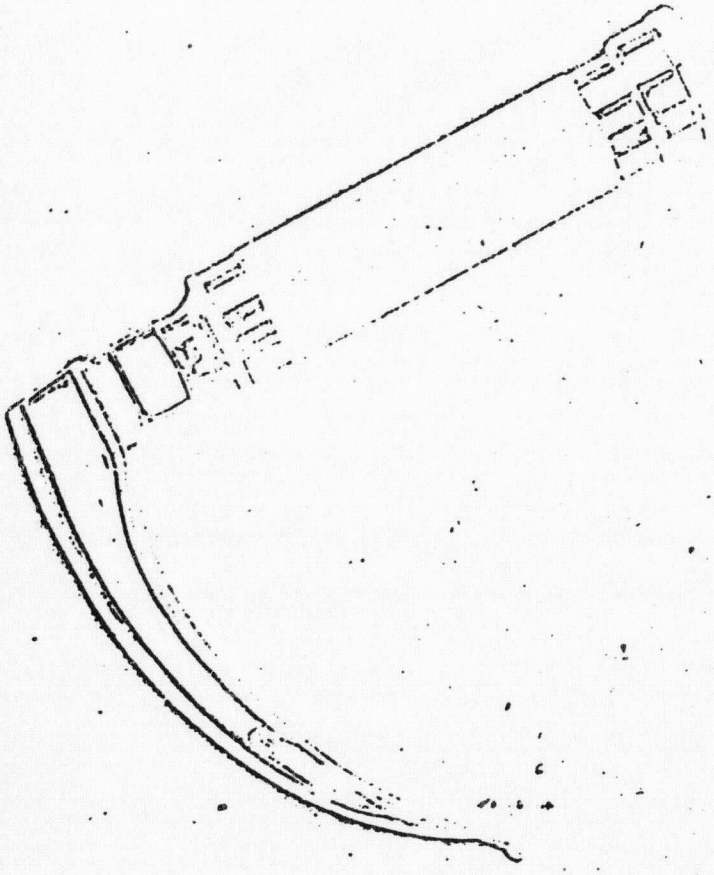
. . . is designed as a combined mouth prop and gag. Forged stainless steel, incorporates cranked scissor type handle and quadrant ratchet locking device.

60-00005	Doyen Gag Child
60-00006	Adult

Ea. $21.50

HARRIS

A 4476



Laryngoscopes

CX-150-V

Stainless Steel Herlake Blades . . .

- Corrosion resistant
- Lightweight
- Autoclavable without removing lamp because of gold plated contacts
- Available in standard hook-on fittings in all sizes of Macintosh, Miller, Robertshaw and Wisconsin

Laryngoscope Handle with Hook-on Fitting . . .

. . . a revolutionary lightweight design. It is standard size using 'C' cells. Manufactured from plated high tensile aluminum. Its weight is 3½ ounces less than the conventional handle of similar size.

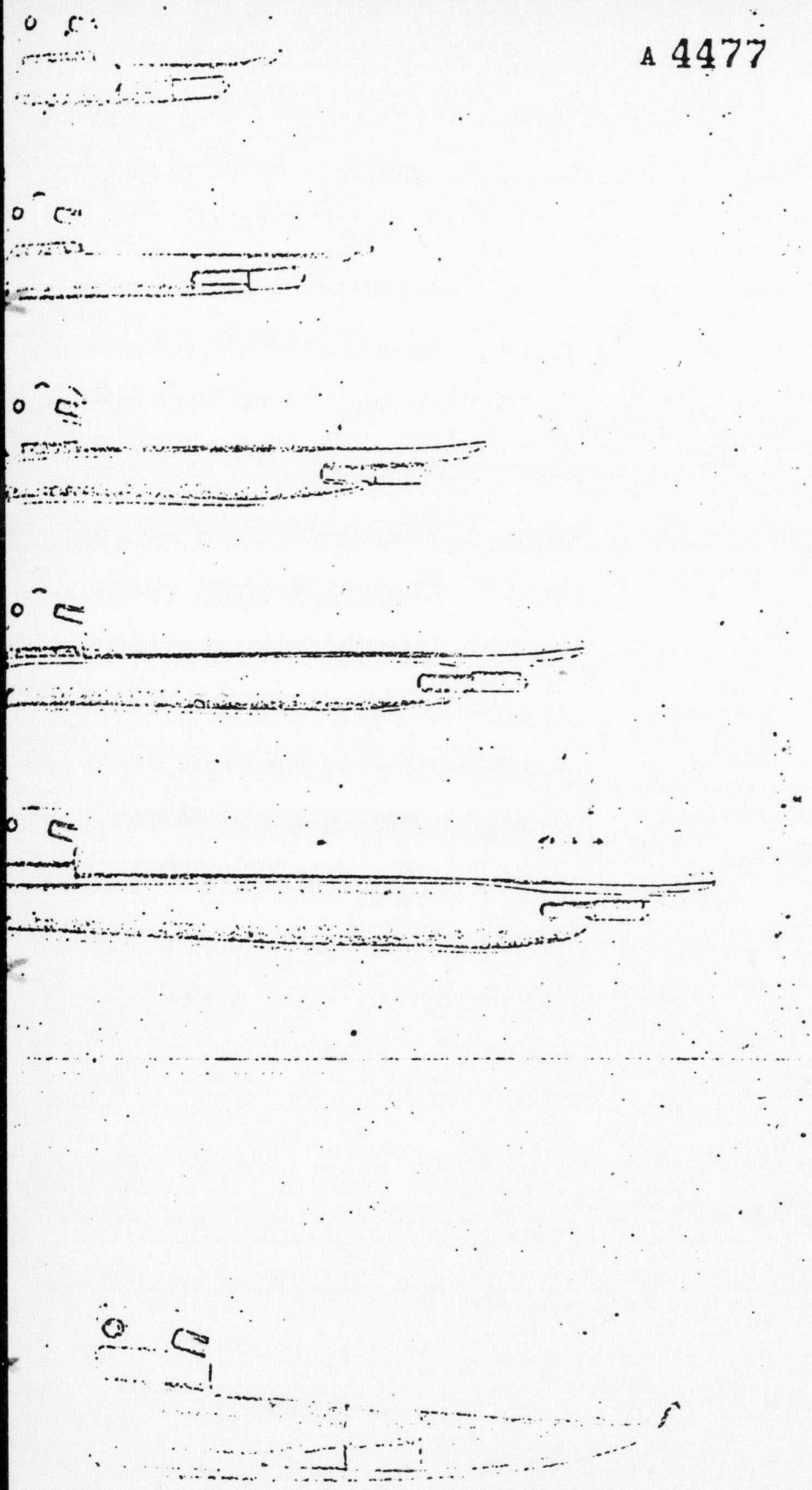
Lamps . . .

. . . are prefocused with a built-in lens for intense splay-free illumination and solid center point contact for long life.

Pouches . . .

. . . are available for the permanent accommodation of sets.

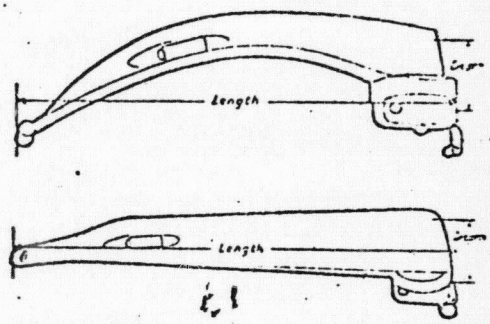
A 4477



Laryngoscopes

BLADES — HANDLES —
SETS — LAMPS —
POUCHES

Blade Dimensions
The sizes listed for laryngoscope blades are in millimeters and refer to the length — chord length in the case of curved blades — from tip to heel and the depth at the heel.



STAINLESS
Wisconsin Laryngoscope Blade . . .
. . . a lightweight conventional straight blade of the popular Wisconsin pattern.

55-00016 Infant Size 0	75 x 9.5mm
55-00017 Infant Size 1	102 x 11mm
55-00018 Child Size 2	135 x 15mm
55-00019 Adult Size 3	162 x 16mm
55-00020 Large Size 4	199 x 19mm

. . . . . All Sizes Ea. $25.50

STAINLESS
Robertshaw Laryngoscope Blade . . .
. . . for infants and children. Gently curved over the proximal third to lift the epiglottis indirectly in the manner of the Macintosh blade. The blade section permits binocular vision allowing better judgment of depth and less risk of trauma. Ref. Robertshaw, Dr. Frank L., "The Lancet," 17, xi, p. 1034.

55-00031 Neonate, 94 x 10 mm
. . . . . Ea. $29.50
55-00032 Infant, 112 x 12 mm
. . . . . Ea. $29.50

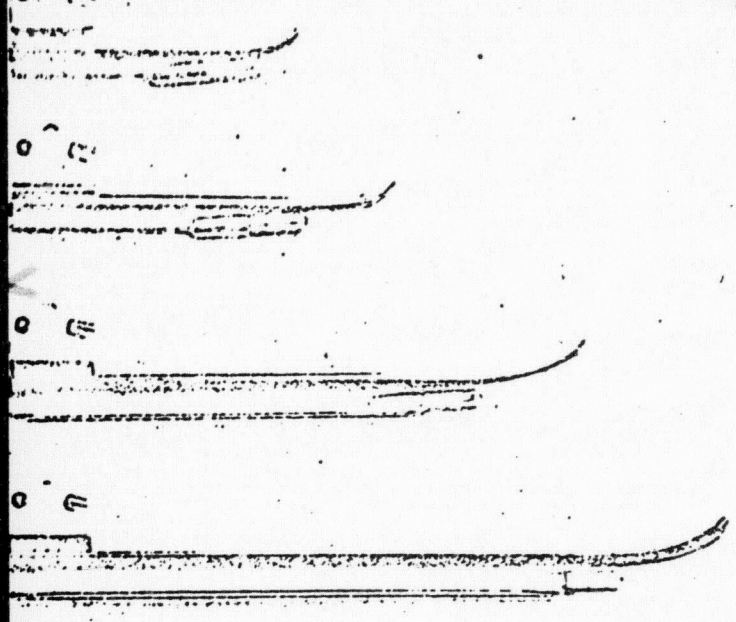
HARRIS-LAKE, INC.

A4478

Laryngoscopes

CX-150-X

BLADES — HANDLES —
SETS — LAMPS —
POUCHES



STAINLESS

Miller Laryngoscope Blade . . .
. . . is an extremely popular blade based on a design suggested by Robert A. Miller M.D.

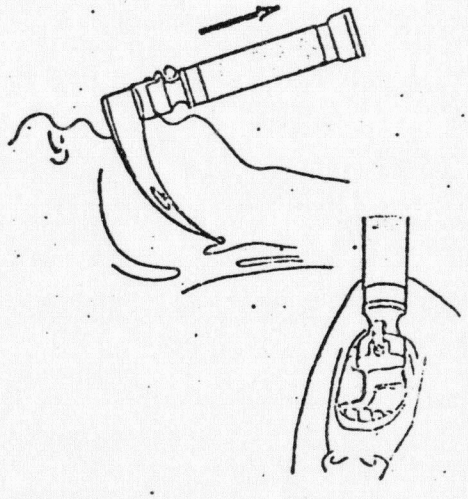
55-00051 Premature, Size 0, 75 x 8 mm
55-00052 Infant, Size 1, 102 x 8 mm
55-00053 Child, Size 2, 150 x 11 mm
55-00054 Adult, Size 3, 190 x 12 mm
. . . . . .All sizes, Ea. $25.50

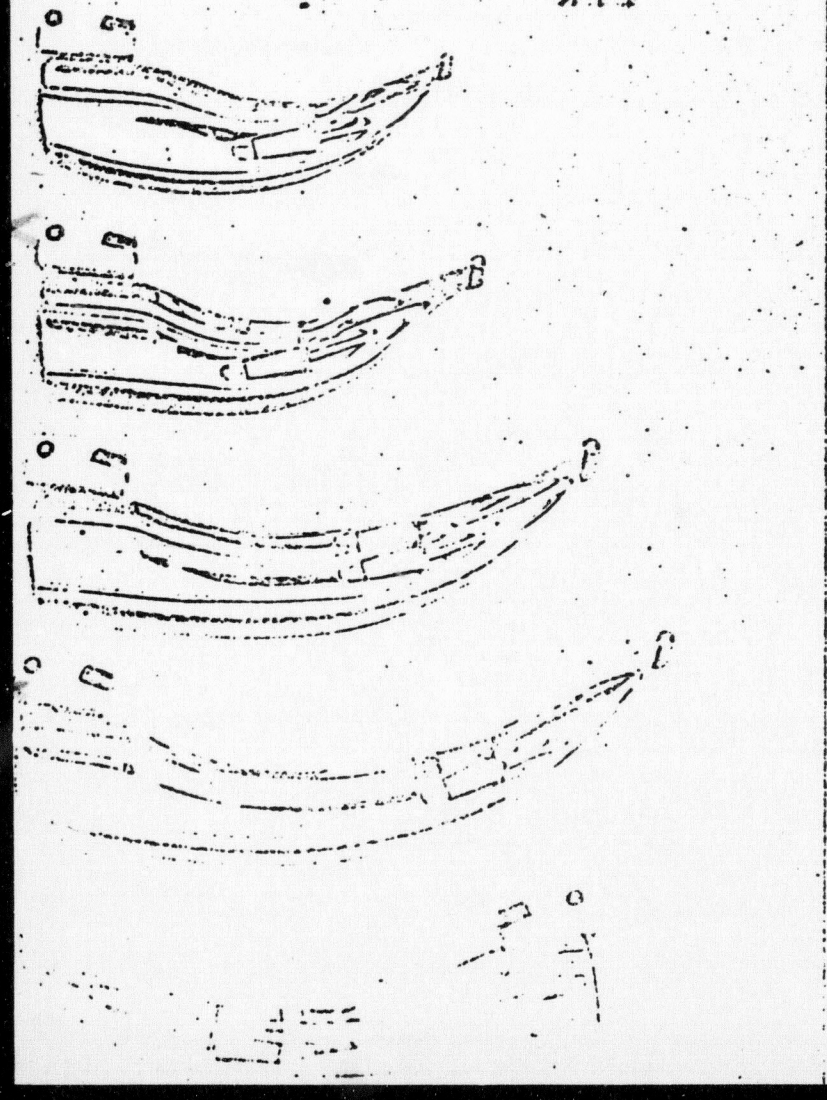
STAINLESS

Macintosh Laryngoscope Blade . . .
. . . is first described by Prof. Sir Robert R. Macintosh in "The Lancet" of Feb. 13, 1943.

55-00041 Infant, 92 x 14 mm
55-00042 Child, 100 x 17 mm
55-00043 Adult, 130 x 18 mm
55-00044 Large, 155 x 18 mm
. . . . . .All sizes, Ea. $25.50

The Macintosh Laryngoscope is correctly used by placing the tip of the blade in the epiglotic fold and then drawing the handle in the direction shown by the arrow in the illustration. This technique eliminates lever action and risk of injury to the upper teeth.



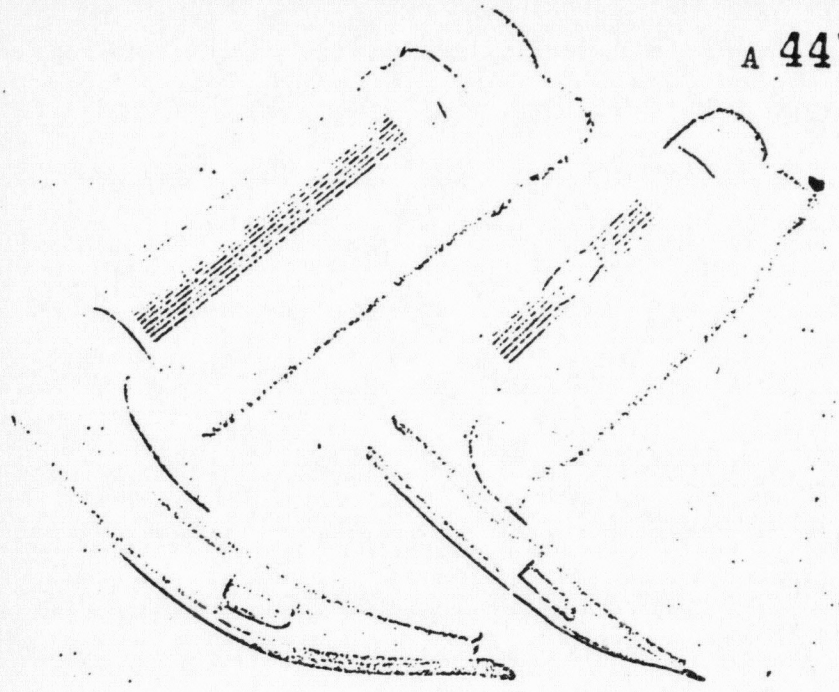


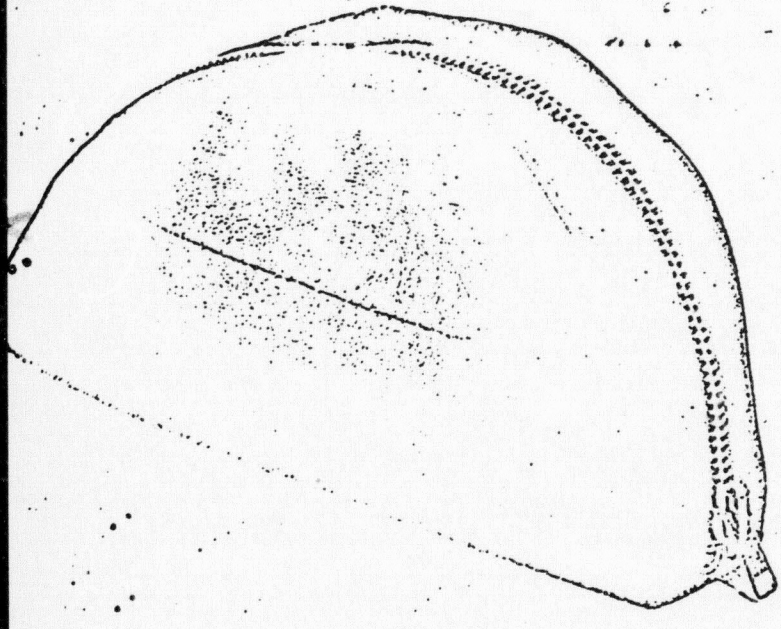
STAINLESS

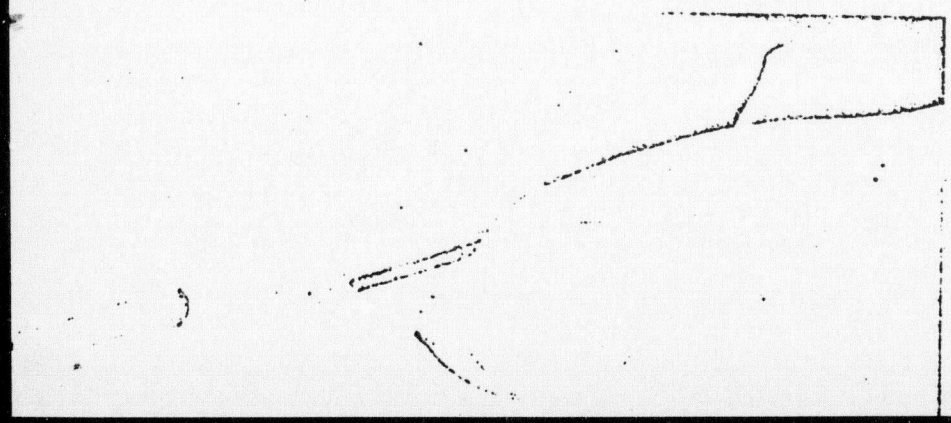
Macintosh Left Hand Laryngoscope Blade . . .
. . . is invaluable in cases where irregularity of dentition makes normal intubation difficult. Also an aid to left-handed personnel.

55-00045 Adult, 130 x 18 mm
. . . . . .Ea. $25.50

A 4479







Laryngoscopes

BLADES — HANDLES —
SETS — LAMPS —
POUCHES

One-Piece Plastic Laryngoscope . . .
. . . combines blade and handle in molded acetal copolymer, a high impact plastic of low reflectivity with smooth atraumatic surfaces. One-piece design reduces number of electrical contact points. Utilizes standard 'C' cells. Can be sterilized by boiling or ethylene oxide. The Macintosh blade has been extended at the heel. It may be used for most patients down to 3 years of age.

55-00081 . . . . . Ea. $30.00

55-00082 Similar to 55-00081 but incorporating a Robertshaw Infant Blade
. . . . . Ea. $30.00

Laryngoscope Pouches . . .
. . . are available for the permanent accommodation of sets. (Blades and handles are normally supplied with each part in an individual wallet)

55-00060 Small (holds handle and 3 blades)
. . . . . Ea. $ 6.50

55-00061 Large (holds handle and 5 blades)
. . . . . Ea. $ 9.50

Lamps . . . .
. . . have solid point center contacts. Focused lense eliminating light-splay and surface reflection. Sold in pack of 5 bulbs.

55-00127 (Laryngoscope) . . Ea. $ 2.50

55-00128 (Bronchoscope) . . Ea. $ 3.25

HARRIS-LAKE, INC.
Manufacturers of Surgical Medical Equipment

A 4480

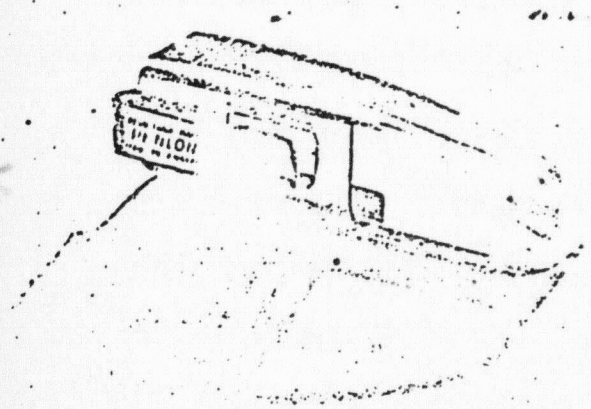
Laryngoscopes

CX-150-2

BLADES — HANDLES — SETS
LAMPS — POUCHES

Lightweight Laryngoscope Handle with Hook-on Fitting . . .
. . . is a revolutionary lightweight design. It is standard size using 'c' cells. Manufactured from plated high tensile aluminum. Its weight is 3½ ounces less than the conventional handle of similar size.

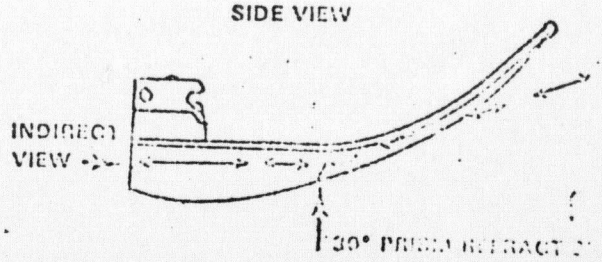
55-00126 Standard Lightweight Handle . . . . . Ea. $15.00



Huffman Prism . . .
. . . is an optically polished prism providing refraction of 30°. Designed to fit the Adult size Macintosh #3 blade.
Invaluable For:

- **Endotracheal intubation, when direct exposure of the vocal cords is impaired**
- **Nasal Intubation**
- **Post-operative examination of the larynx**

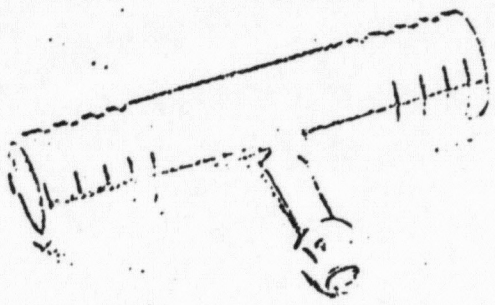
55-00040 . . . . . Ea. $22.50



A 4481

Connectors

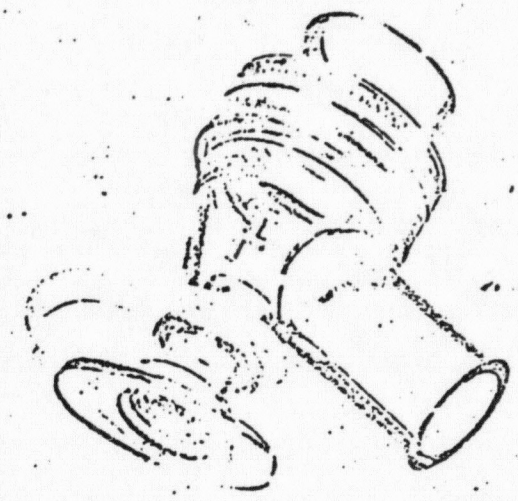
ENDOTRACHEAL AND TRACHEOSTOMY



Ayre's "T" Tube . . .

. . . is for endotracheal intubation and controlled respiration in infants and children. (Ayre, P., Brit. Journal Anaesthesia 1950, 22:500).

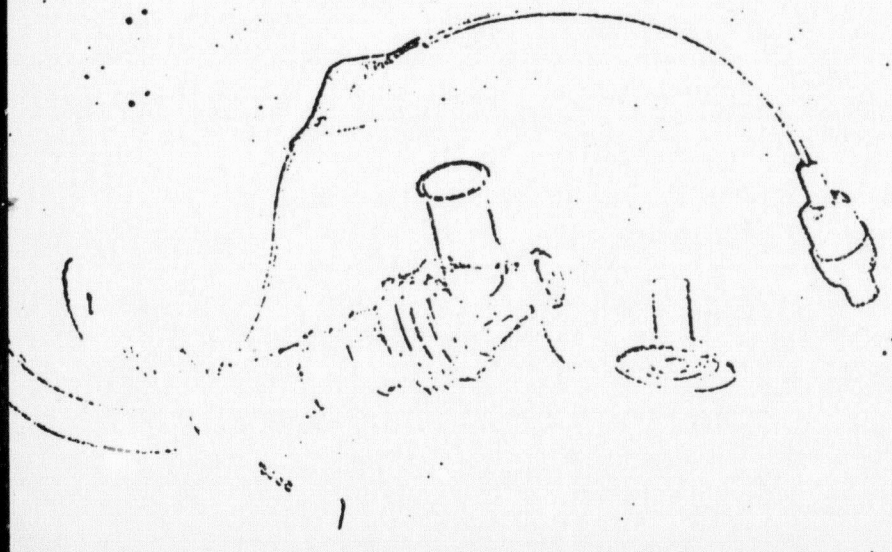
57-00001 Small . . . . . Ea. $4.00
57-00002 Large . . . . . Ea. $4.00



Harlake Swiveltrach® Connecting Union . . .

. . . is a light, disposable tracheostomy adapter. Manufactured in clear non-toxic plastic. It swivels freely through 360°, has minimum deadspace, leaktight, incorporates capped suction port to facilitate tracheostomy toiletry without disconnection. Packaged individually in sterile peel-pack, 10 units to a box.

57-00700 Swiveltrach
Box of 10 . . . . . $18.00
10 to 49 Boxes . . . . . per box $17.00
50 Boxes and over . . . per box $16.00



Equally suited for use as an endotracheal or tracheostomy connecting union. Illustrated is the swiveltrach attached directly to a conventional plastic cuffed tracheostomy tube.

HARRIS-LAKE, INC.
Manufacturers of Harlake Medical

A4482

Connectors

ENDOTRACHEAL AND TRACHEOSTOMY

Harlake Disposable 15mm Straight Connectors . . .

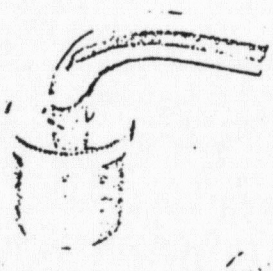
. . . are manufactured from white nylon. They can be re-sterilized by all conventional methods. Available in 10 sizes 3.0mm-12.0mm. Ten connectors of one size to a pack.

57-00930	3.0mm
57-00940	4.0mm
57-00950	5.0mm
57-00960	6.0mm
57-00970	7.0mm
57-00980	8.0mm
57-00990	9.0mm
57-00910	10.0mm
57-00911	11.0mm
57-00912	12.0mm

1-9 packs . . . . . $3.00 per pack/10
10-99 packs . . . . . $2.50 per pack/10
100 packs and over . . $2.25 per pack/10

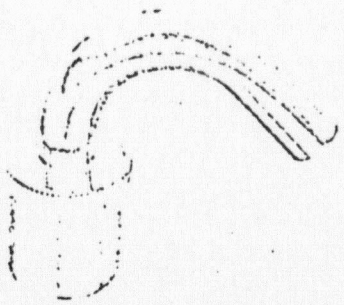
Straight Connectors, Stainless, 15mm

57-00125	2.5mm	
57-00130	3.0mm	
57-00140	4.0mm	
57-00150	5.0mm	
57-00160	6.0mm	
57-00170	7.0mm	Ea. $2.00
57-00180	8.0mm	
57-00190	9.0mm	
57-00110	10.0mm	
57-00111	11.0mm	
57-00112	12.0mm	



Oral Connectors, Curved 90°, Plated 15mm

57-00230	3.0mm	
57-00240	4.0mm	
57-00250	5.0mm	
57-00260	6.0mm	
57-00270	7.0mm	Ea. $2.50
57-00280	8.0mm	
57-00290	9.0mm	
57-00210	10.0mm	
57-00211	11.0mm	
57-00212	12.0mm	



Nasal Connectors, Curved 90°, Plated 15mm

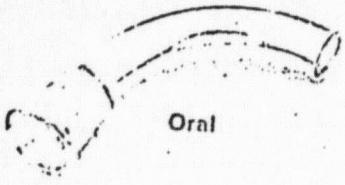
57-00330	3.0mm	
57-00340	4.0mm	
57-00350	5.0mm	
57-00360	6.0mm	
57-00370	7.0mm	Ea. $2.50
57-00380	8.0mm	
57-00390	9.0mm	
57-00310	10.0mm	
57-00311	11.0mm	
57-00312	12.0mm	

A 4483

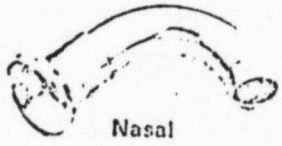
EX-156-2-3

Connectors

ENDOTRACHEAL AND TRACHEOSTOMY



Oral



Nasal

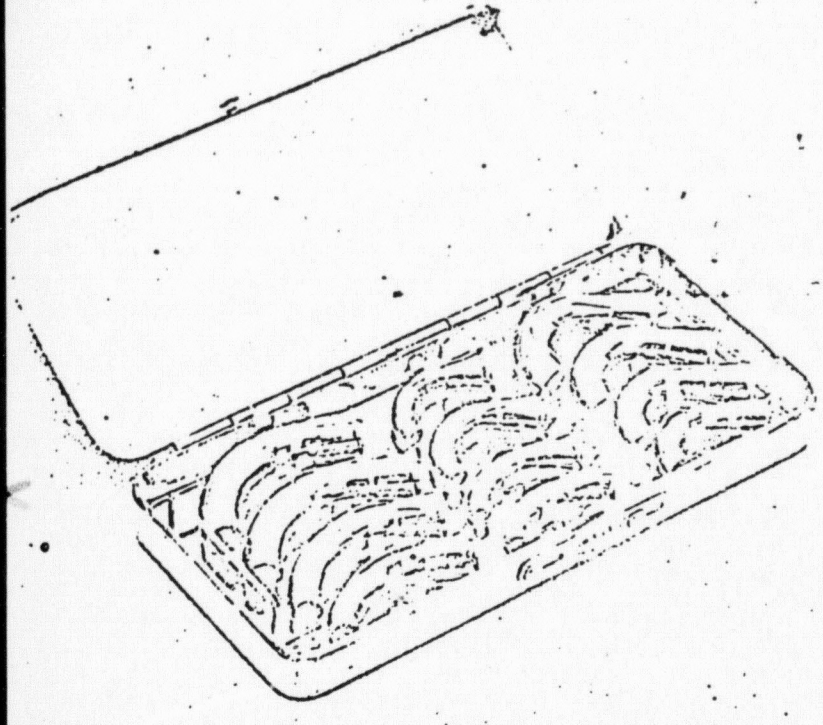
Magill Endotracheal Connectors . . .
. . . are lightweight endotracheal connectors with correct oral and nasal curves. The preferred connector for rubber to metal connection. Often used in conjunction with the 51-00007 pediatric cone hose adapter and 3½" corrugated catheter mount tube, to provide flexibility as a precaution against accidental extubation.

Oral

57-00400	Size 00	2.5mm	
57-00401	Size 0	3.0mm	
57-00402	Size 1	4.0mm	
57-00403	Size 2	5.0mm	
57-00404	Size 3	3.0mm	Ea.
57-00405	Size 4	7.0mm	$3.50
57-00406	Size 5	8.0mm	
57-00407	Size 6	9.0mm	
57-00408	Size 6A	9.5mm	
57-00409	Size 6B	10.0mm	

Nasal

57-00410	Size 7	4.0mm	
57-00411	Size 8	5.0mm	
57-00412	Size 9	6.0mm	Ea.
57-00413	Size 10	7.0mm	$3.50
57-00414	Size 11	8.0mm	
57-00415	Size 12	9.0mm	
57-00416	Size 12A	9.5mm	
57-00417	Size 12B	10.0mm	



Set of 12 connectors (6 oral and 6 nasal) complete in stainless case incorporating removable inner tray to facilitate sterilizing.

57-00420 . . . . . Ea. Set $49.50

Infant Connector with side inlet

57-00418 Size 00 (2.5mm) $5.50
57-00419 Size 0 (3.5mm) $5.50

HARRIS-LAKE, INC.

Manufacturers of Deluxe Medical Equipment

A 4484

Cannula and Suction Catheters

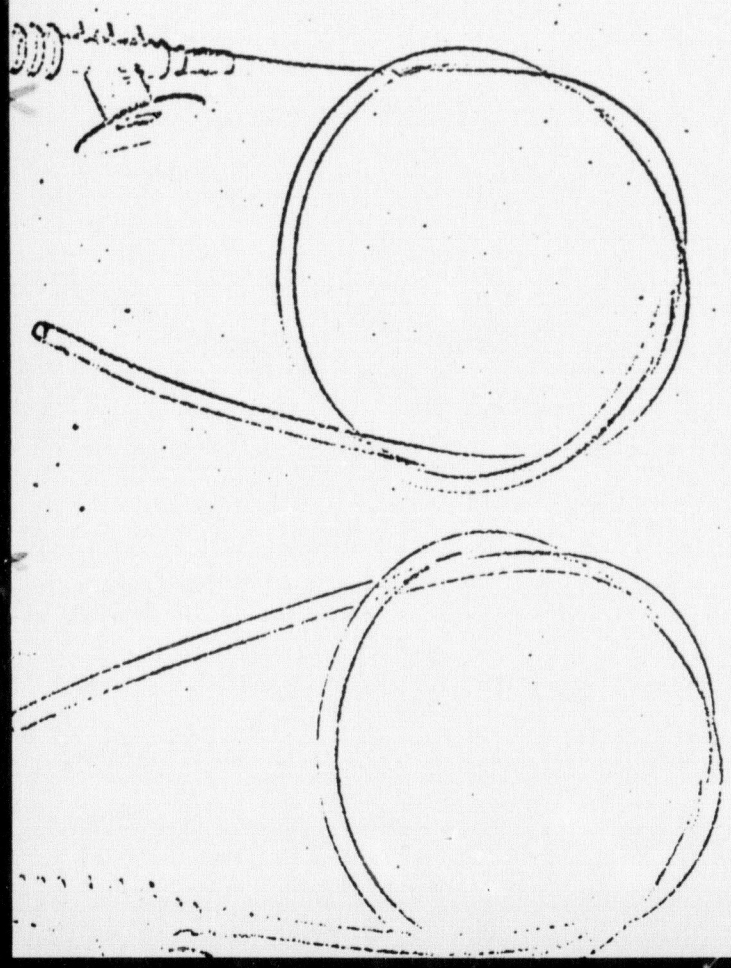
2-4

Epidural Cannula with Stylet . . .
. . . Is manufactured from surgical grade flexible nylon. This nylon, which satisfies new strict implant tests, has proven the ultimate material, giving maximum protection against kinking and severance. With continuous or intermittant administration of epidural anesthetics, more safety and control of the cannula is possible with the new metal stylet supplied.

Designed for use with a 16 or 17 gauge needle, the cannula is 90 cm (36") in length with a closed rounded end and one lateral eye. Each cannula is calibrated at 5 cm (1 ring), 10 cm (2 rings), 15 cm (3 rings) and 20 cm (4 rings) to indicate the depth of insertion.

In the proximal end of the cannula a blunt tip needle fits securely forming part of a detachable Luer-lock mount. This facility allows the complete removal of the Epidural needle. If required, a latex cap fitted to the hub permits intermittent injections.

56-00003 Box of ten
Cannula . . . . . $16.50 Per box
Ten Boxes . . . $15.00 Per box
50 Boxes . . . . $14.00 Per box



Disposable Suction Catheters . . .
. . . are siliconized for ease of entry and removal. Incorporate raised finger-tip control valve with appropriate sizing of aperture for sensitive suction control and elimination of possible contamination by secretions. Thin walled for maximum lumen, flexibility and kink-resistance. Non traumatic Coude ends available in straight or angled patterns. Length 22". Individually sterile peel-packaged in boxes of 50 catheters of one size.

Whistle Tip With Lateral Eye

56-00505	5FR	56-00512	12FR
56-00506	6FR	56-00514	14FR
56-00508	8FR	56-00516	16FR
56-00510	10FR	56-00518	18FR

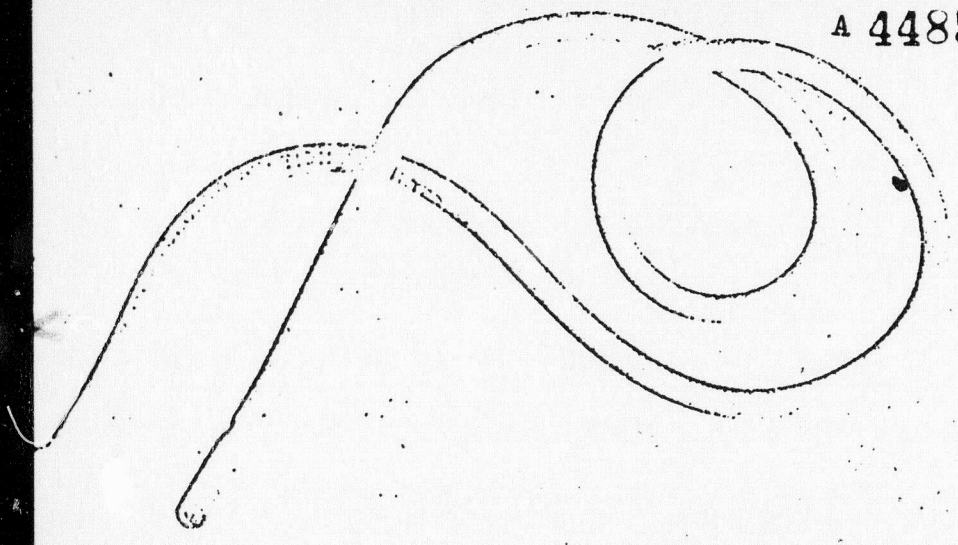
Angled With Two Lateral Eyes

56-00612 . . . . . 12FR
56-00614 . . . . . 14FR
56-00616 . . . . . 16FR
. . . . . $23.00 Per box
10 or more boxes . . . . . $21.50 Per box

CX-150
2-5

A 4485

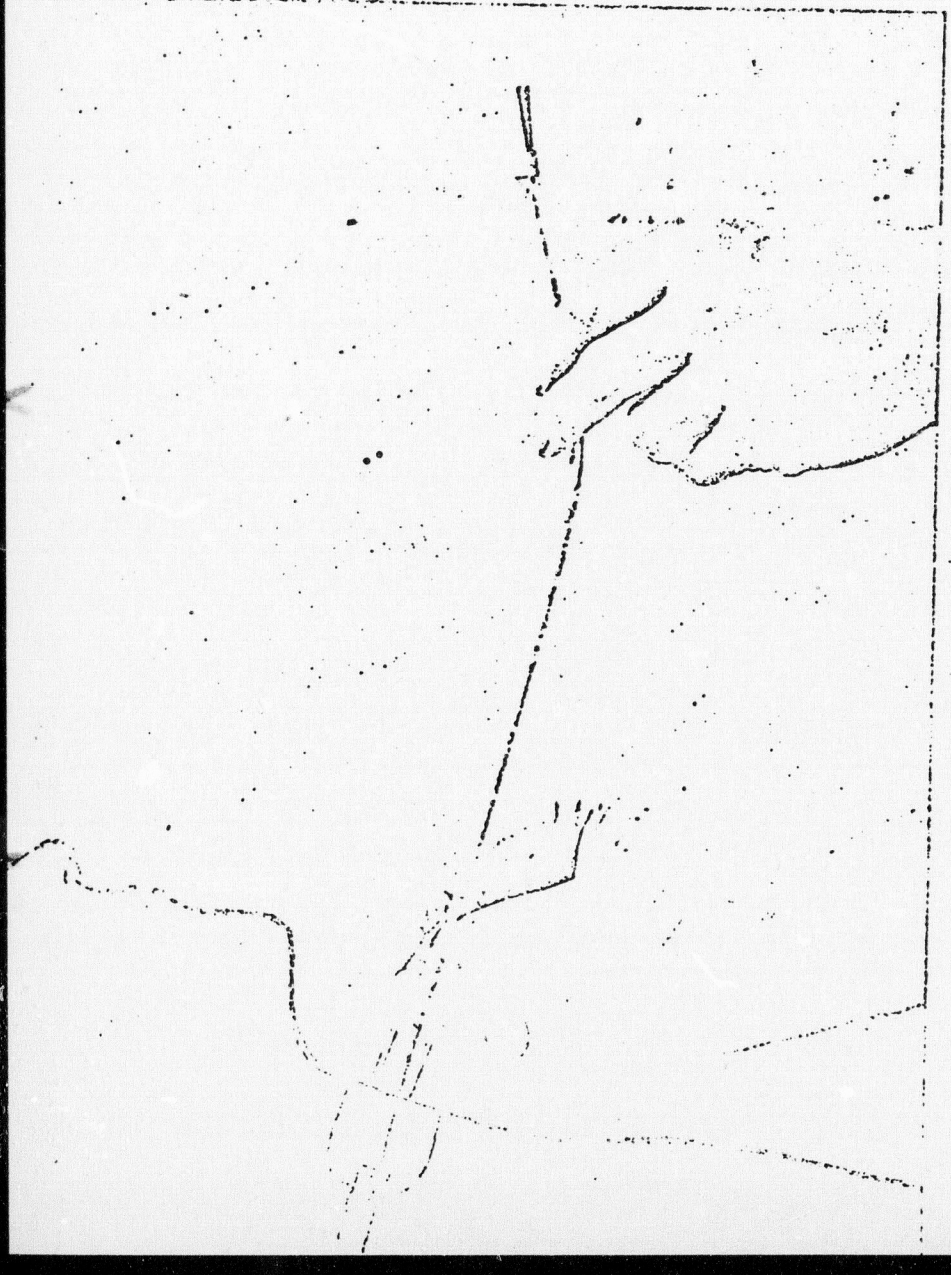
Suction Catheters



Toronto Endobronchial Suction Catheters . . .

. . . are manufactured in soft non-traumatic red rubber. They incorporate a coude type tip and proximal marker for easier insertion. Three holes, one distal and two lateral. Developed by the Respiratory Insufficiency Unit of the Toronto General Hospital. (Ref. International Anesthesiology. Clinics Vol. 1 No. 2 Dr. H. B. Fairley, "Respiratory Insufficiency").

56-00412 18" Length	12FR
56-00414	14FR
56-00416	16FR
56-00418	18FR
	Ea. $1.80
10-99	Ea. $1.60
100 and over	Ea. $1.40



Harlake Aseptic Suction Catheter . . .

. . . a new advanced concept in tracheostomy suction. Because of its unique packaging, catheter sterility is ensured throughout suctioning procedure.

Preparation time is reduced to a minimum and the need for gloves is eliminated.

The catheter is manufactured in "Formex" which has low friction co-efficient for ease of entry.

Each catheter is enclosed in a sterile inner pack to which is attached a specially designed plastic fitting for direct attachment to the tracheostomy tube connector.

After the seal of the inner package has been broken and the connector attached to the tube the catheter can be introduced in the normal way, but without direct hand contact. Terminal end of the pack is then removed for connection to the suction unit.

The catheter has a whistle tip and two staggered lateral eyes to prevent blockage and avoid tissue damage.
Available in 3 sizes, 20 inches in length.

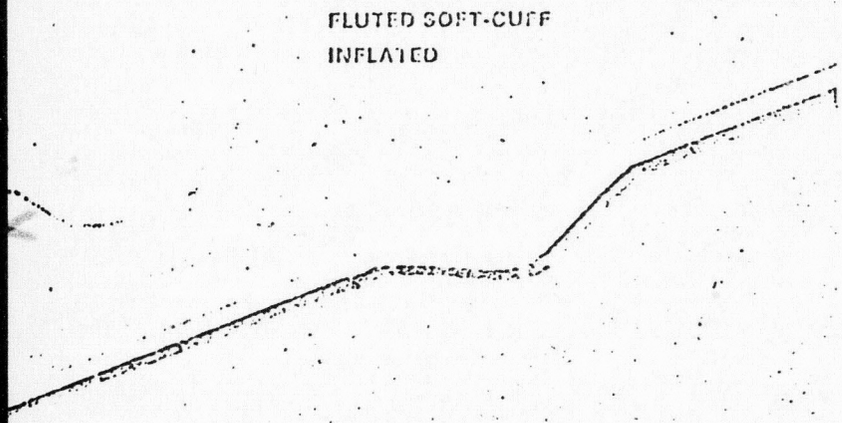
56-00710	10FR
56-00714	14FR
56-00718	18FR
Packaged 10 catheters of one size to a box	$6.50 per box
10 to 99 boxes	$6.00 per box
100 boxes and over	$5.50 per box

HARRIS-LAKE, INC.

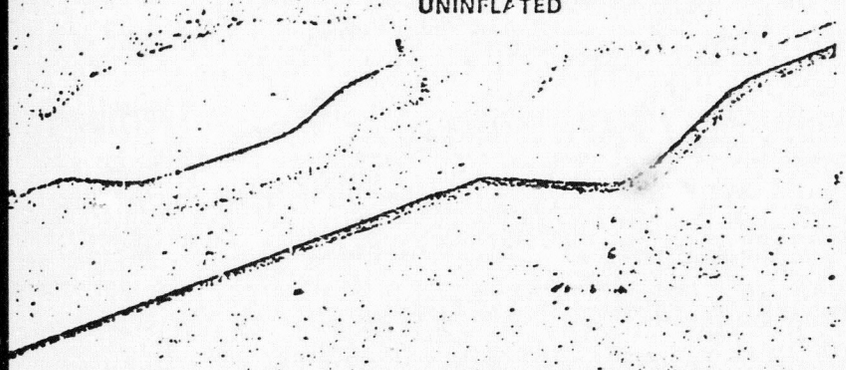
A 4486

2X-1.50-
2-6

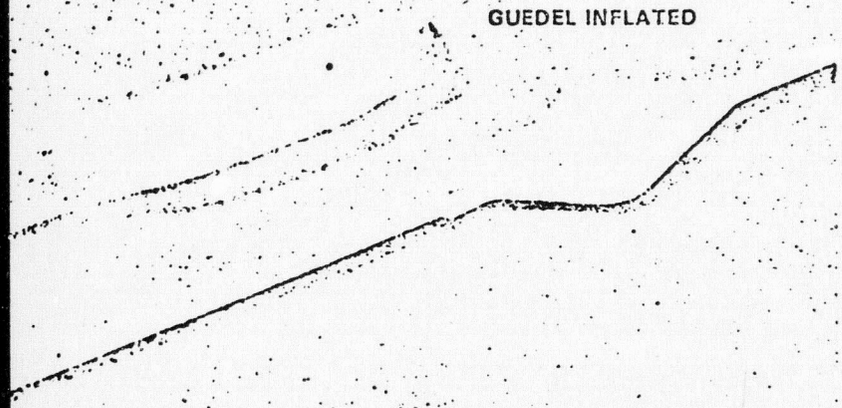
Detachable Latex Cuffs Endotracheal



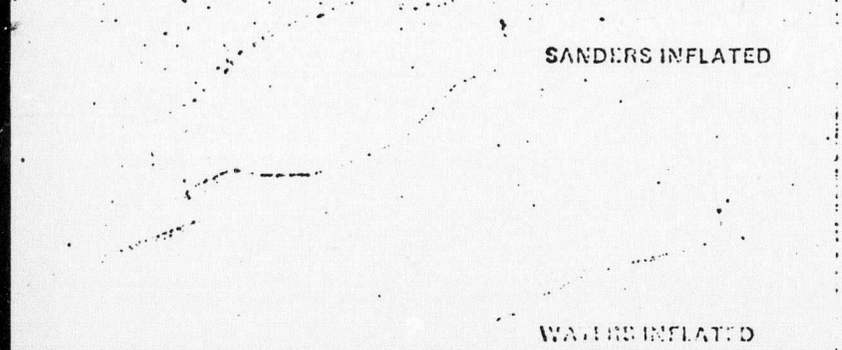
FLUTED SOFT-CUFF
INFLATED



FLUTED SOFT-CUFF
UNINFLATED



GUEDEL INFLATED



SANDERS INFLATED

WATERS INFLATED

Harlake Fluted Soft-Cuffs With Pilot Balloon . . .

. . . are manufactured from the finest implant tested pure mineral latex rubber ensuring a complete seal within the trachea with a minimum of inflation pressure. The fluted design permits larger surface contact when inflated and aids visibility during intubation when collapsed. It also prevents accidental 'folding' of the cuff during inflation.

58-00950	5.0mm	58-00995	9.5mm
58-00965	6.5mm	58-00911	11.0mm
58-00980	8.0mm	58-00912	12.5mm

Packaged 5 cuffs of one size to a box. . . . . Per box $11.50

Guedel Bulge-Type Cuff . . .
. . . is a double wall cuff of conventional design in implant tested pure mineral latex rubber.

With Pilot Balloon

58-00550	5.0mm	58-00595	9.5mm
58-00565	6.5mm	58-00511	11.0mm
58-00580	8.0mm	58-00512	12.5mm

Packaged 5 cuffs of one size to a box. . . . . Per box $ 8.25

Without Pilot Balloon

58-00750	5.0mm	58-00795	9.5mm
58-00765	6.5mm	58-00711	11.0mm
58-00780	8.0mm	58-00712	12.5mm

Packaged 5 cuffs of one size to a box. . . . . Per box $ 7.50

Sanders Low-Pressure Cuff . . .
. . . is a single-wall latex cuff for cementing to tube.

58-00600 Small

58-00601 Medium

58-00602 Large

Packaged 5 cuffs of one size to a box. . . . . Per box $ 8.00

Waters Flat Cuff . . .
. . . is a double wall cuff of slim proportions.

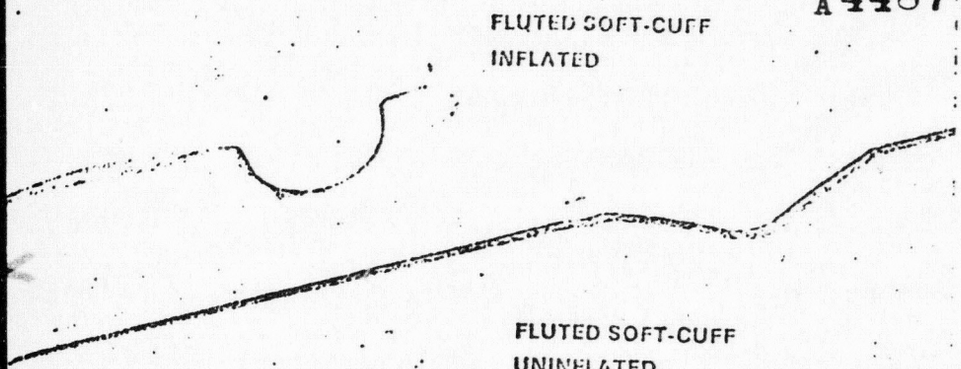
58-00350	5.0mm	58-00395	9.5mm
58-00365	6.5mm	58-00311	11.0mm
58-00380	8.0mm	58-00312	12.5mm

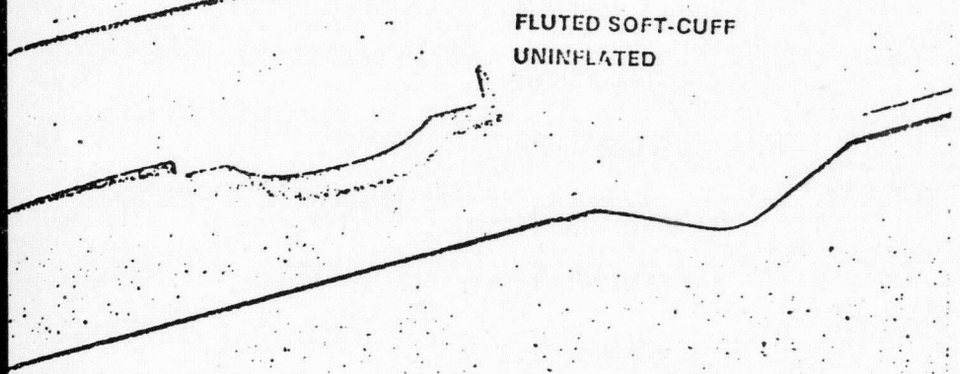
Packaged 5 cuffs of one size to a box. . . . . Per box $ 7.00

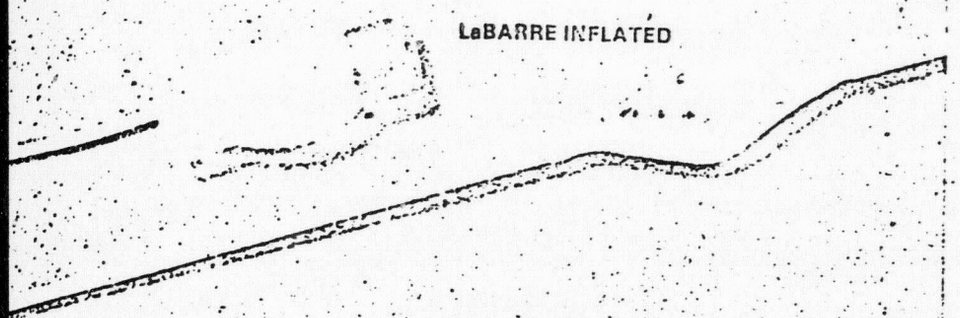
A 4487

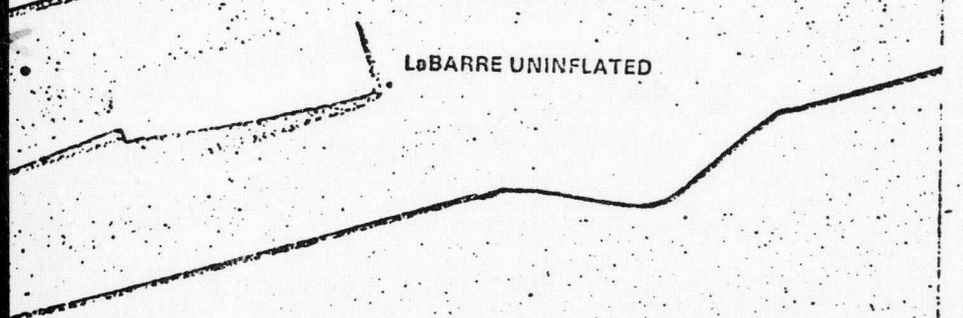
Tracheostomy Cuffs and Cuff Spreader

CX-150-2-7









The Harlake Fluted Soft Tracheostomy Cuff With Pilot Balloon . . .

. . . a specially sized fluted soft cuff for tracheostomy tubes, available in five sizes to fit 21 through 42Fr tracheostomy tubes (Jackson 4 through 10). In all other respects these cuffs are comparable to the Harlake soft-cuff for tracheal tube use.

58-01965	6.5mm
58-01980	8.0mm
58-01995	9.5mm
58-01911	11.0mm

Packaged 5 cuffs of one size to a box . . . . . $11.50 Per Box

Tracheostomy Cuff - Labarre Pattern . . .

. . . a smooth short-cuff of conventional design, available in 9 sizes.

58-01540	4.0mm
58-01550	5.0mm
58-01560	6.0mm
58-01570	7.0mm
58-01580	8.0mm
58-01590	9.0mm
58-01510	10.0mm
58-01511	11.0mm
58-01512	12.0mm

Packaged 5 cuffs of one size to a box. . . . . $ 8.25 Per Box

Cuff Spreader - Stainless . . .

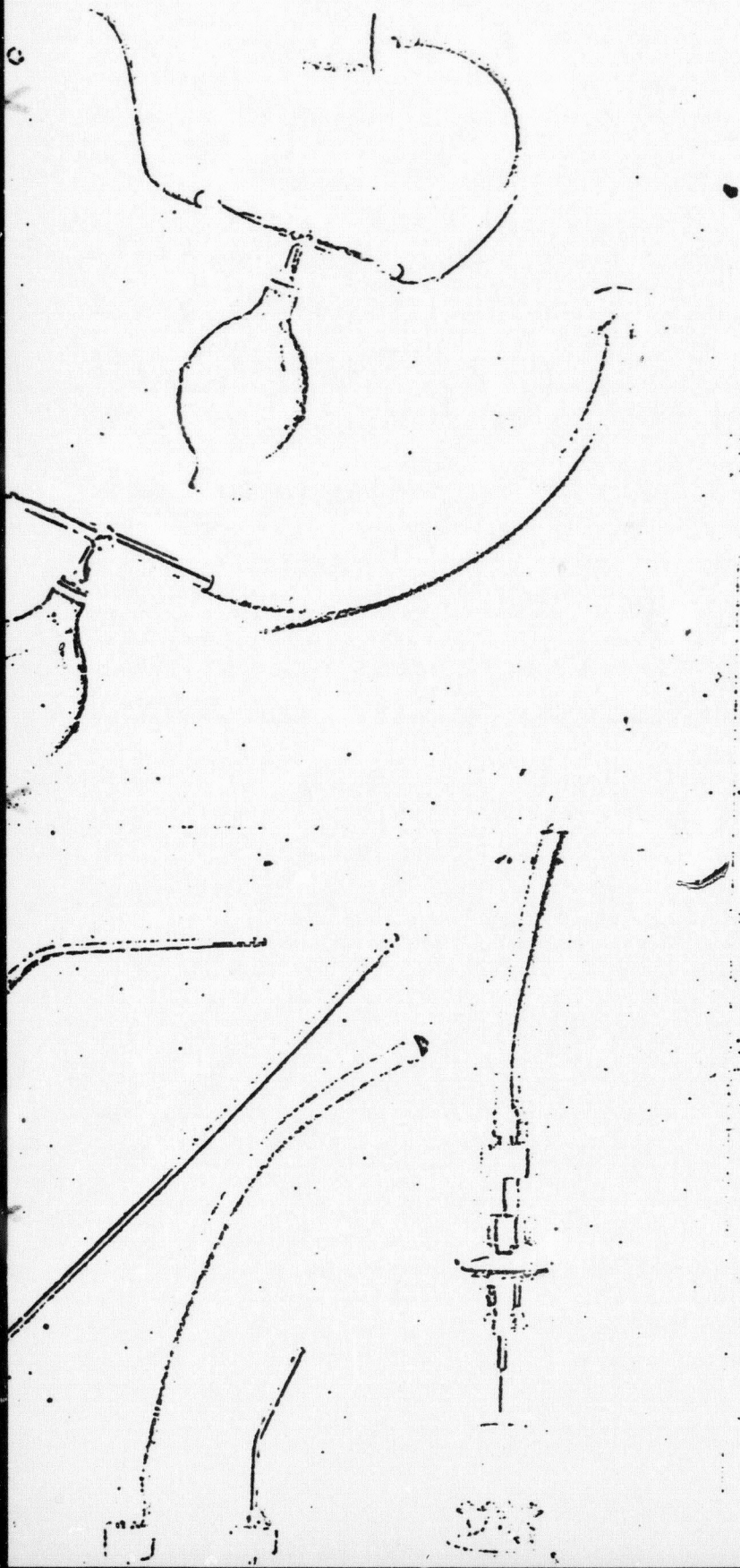
. . . an invaluable aid to the attachment of all detachable cuffs to tracheal or tracheostomy tubes.

60-00015 . . . . . Ea. $ 8.00

HARRIS-LAKE, INC.

Manufacturers of Surgical Instruments

A 4488



Laryngeal Sprays

Macintosh Sprays . . . (top)
. . . feature a solution bottle attached to a flexible tube of sufficient length to ensure that in normal use it is below the level of the nozzle, minimizing the risk of syphoning. The oral version is fitted with a malleable insert.

65-00001 Oral . . . . . Ea. $21.50

65-00002 Nasal . . . . . Ea. $21.50

Forrester Spray . . .
. . . similar to the Macintosh but with a curved metal delivery tube.

65-00003 . . . . . Ea. $21.50

Multicaine Spray . . .
. . . is designed for one handed operation. A choice of interchangeable spray nozzles are available. The rubber bulb is a unit molding incorporating an air inlet valve in the suction-cup base. The plastic bottle is of 4 c.cs capacity.

65-00051 Multicaine Spray (Less Nozzle) $29.00

65-00052 Rowbotham Nozzle . . $11.50

65-00053 Dinsdale Nozzle $12.50

65-00054 Macintosh, Oral $19.50

65-00055 Macintosh, Nasal . . . $19.50

65-00056 Magill Nozzle $11.00

Replacement Parts

65-00057 Bulb Assembly $12.00

65-00058 Bottle Assembly . . . . . $ 6.75

65-00059 Metal Body Assembly $12.50

A 4489 Tubes, Endotracheal

2X-150-2-7

A GUIDE TO VARIOUS TUBE SIZING METHODS

Internal Diameter-mm	External Diameter-mm	Magill Sizing	French* Gauge	Cuff Size	Connector Size
2.5mm	4.0mm	000	12FR		2.5mm
3.0mm	4.5mm	00	12-14FR		3.0mm
3.5mm	5.0mm	0A	14-16FR	3/16"- 5.0mm	3.0mm
4.0mm	5.5mm	0	16-18FR		4.0mm
4.5mm	6.0mm	1	18-20FR		4.0mm
5.0mm	6.5mm	2	20-22FR	1/4"- 6.5mm	5.0mm
5.5mm	7.0mm	3	22FR		5.0mm
6.0mm	8.0mm	4	24FR		6.0mm
6.5mm	8.5mm	5	26FR		6.0mm
7.0mm	9.0mm	6	28FR	5/16"- 8.0mm	7.0mm
7.5mm	9.5mm	7	30FR		7.0mm
8.0mm	10.0mm	8	32FR		8.0mm
8.5mm	11.5mm	-	34FR	3/8"- 9.5mm	8.0mm
9.0mm	12.0mm	9	36FR		9.0mm
9.5mm	12.5mm	10	38FR		9.0mm
10.0mm	13.0mm	11	40FR	7/16"-11.0mm	10.0mm
11.0mm	14.5mm	12	42FR		11.0mm

* Diameter in mms and French Gauge sizes are approximate sizes only since the thickness of tubes vary dependent upon material.

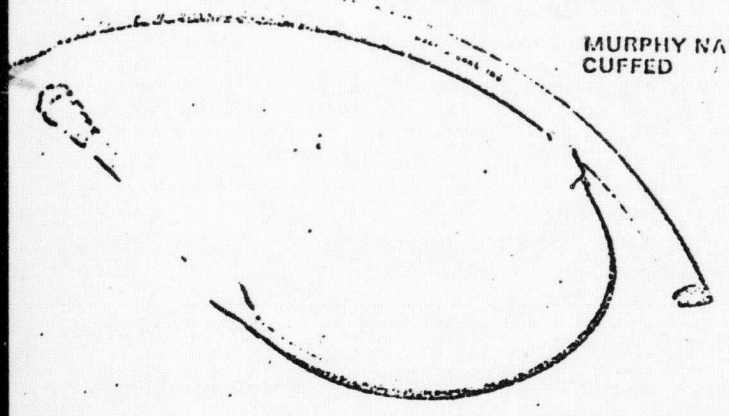
HARRIS LABS, INC.
Manufacturers of

Tubes, Endotracheal

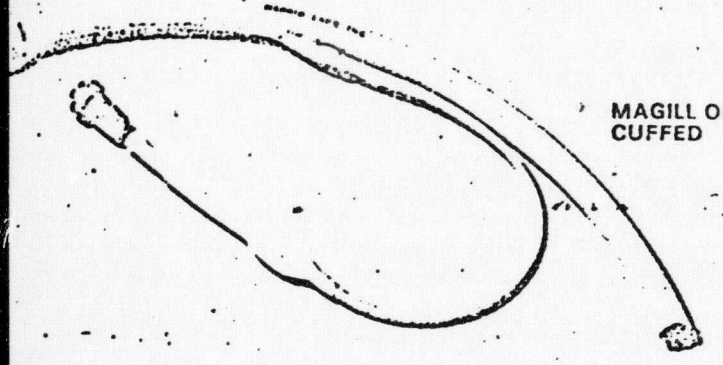
CX-150-
2-10

A 4490

MURPHY NASAL CUFFED

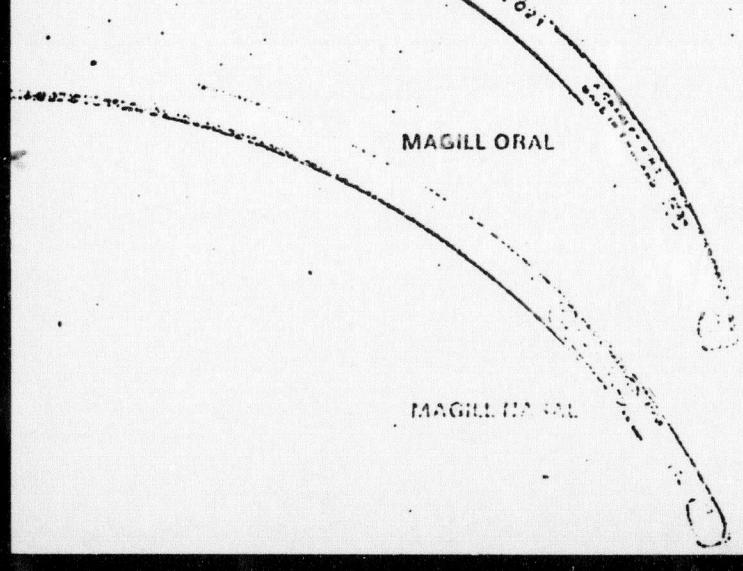


MAGILL ORAL CUFFED



MURPHY ORAL

MAGILL ORAL



Harlake Red Rubber Cuffed Endotracheal Tubes . . .

. . . are made from a new non-toxic pure mineral rubber without overdipping. They are kink-resisting in normal use. The inflation canals are built into the tube wall without loss of lumen. The cuffs are recessed into the tube walls eliminating all ridges and inflate symmetrically. A self-sealing valve is provided with each tube. Available in Murphy pattern oral and nasal, and Magill pattern oral, in the full size range.

Murphy, Cuffed, Oral

61-00450	5.0mm	61-00480	8.0mm
61-00455	5.5mm	61-00485	8.5mm
61-00460	6.0mm	61-00490	9.0mm
61-00465	6.5mm	61-00495	9.5mm
61-00470	7.0mm	61-00410	10.0mm
61-00475	7.5mm	61-00411	11.0mm

. . . . . Ea. $3.95

Murphy, Cuffed, Nasal, Thin-wall

61-00550	5.0mm	61-00580	8.0mm
61-00555	5.5mm	61-00585	8.5mm
61-00560	6.0mm	61-00590	9.0mm
61-00565	6.5mm	61-00595	9.5mm
61-00570	7.0mm	61-00510	10.0mm
61-00575	7.5mm	61-00511	11.0mm

. . . . . Ea. $4.35

Magill, Cuffed, Oral

61-01950	5.0mm	61-01980	8.0mm
61-01955	5.5mm	61-01985	8.5mm
61-01960	6.0mm	61-01990	9.0mm
61-01965	6.5mm	61-01995	9.5mm
61-01970	7.0mm	61-01910	10.0mm
61-01975	7.5mm	61-01011	11.0mm

. . . . . Ea. $3.75

Harlake Uncuffed Rubber Endotracheal Tubes . . .

. . . similar in texture to the cuffed tubes. Available in Murphy oral, Magill oral and nasal.

Murphy, Rubber, Oral

61-00325	2.5mm	61-00365	6.5mm
61-00330	3.0mm	61-00370	7.0mm
61-00335	3.5mm	61-00375	7.5mm
61-00340	4.0mm	61-00380	8.0mm
61-00345	4.5mm	61-00390	9.0mm
61-00350	5.0mm	61-00395	9.5mm
61-00355	5.5mm	61-00310	10.0mm
61-00360	6.0mm	61-00311	11.0mm

. . . . . Ea. $1.45

Magill, Oral

61-01725	2.5mm	61-01765	6.5mm
61-01730	3.0mm	61-01770	7.0mm
61-01735	3.5mm	61-01775	7.5mm
61-01740	4.0mm	61-01780	8.0mm
61-01745	4.5mm	61-01790	9.0mm
61-01750	5.0mm	61-01795	9.5mm
61-01755	5.5mm	61-01710	10.0mm
61-01760	6.0mm	61-01711	11.0mm

. . . . . Ea. $1.25

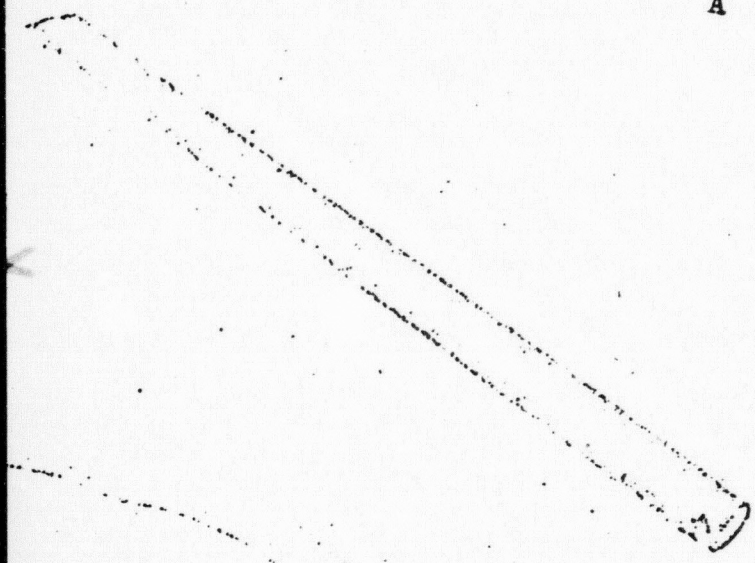
Magill, Nasal

61-01850	5.0mm	61-01875	7.5mm
61-01855	5.5mm	61-01880	8.0mm
61-01860	6.0mm	61-01885	8.5mm
61-01865	6.5mm	61-01890	9.0mm
61-01870	7.0mm	61-01810	10.0mm

. . . . . Ea. $1.25

A 4491 Tubes, Endotracheal

CX-150-2-11



Enderby Infant Reinforced Tube . . .

. . . a nylon imbedded latex tube of thin wall construction. Tapered for two thirds of its length from the proximal end allowing for a larger connector preventing reduction of lumen. Sizes 3.0mm and 4.0mm are particularly suitable for cleft palate work.

61-01530 3.0mm
61-01540 4.0mm
61-01545 4.5mm
61-01550 5.0mm

. . . . . Ea. $3.50

Cole Single-Use Infant Tube . . .

. . . a popular plastic infant endotracheal tube, implant tested. The proximal end of all size tubes is common — 22FR and will accept a size 4.0mm connector. Individually sterile packaged, 10 tubes of one size to a box.

61-02008 8FR.
61-02010 10FR.
61-02012 12FR.
61-02014 14FR.
61-02016 16FR.
61-02018 18FR.

Per Box (10 tubes) $7.50

Self-Sealing Inflation Valve — Luer . . .

. . . designed to fit inflation canals of all cuffed tubes. Inflation and deflation by means of a syringe, obviates the need of a clamp.

61-00001 . . . . . $ .60

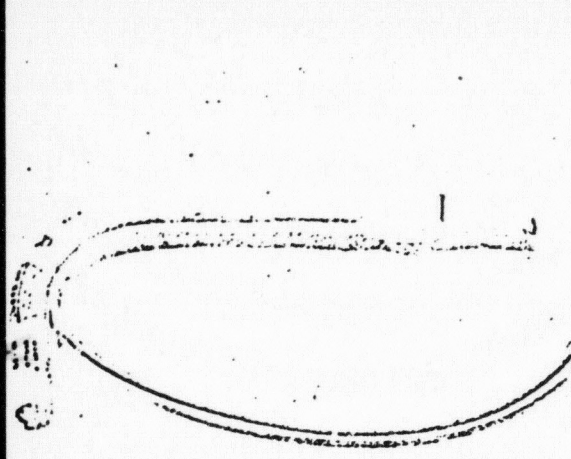
Mitchell Cuff Inflator . . .

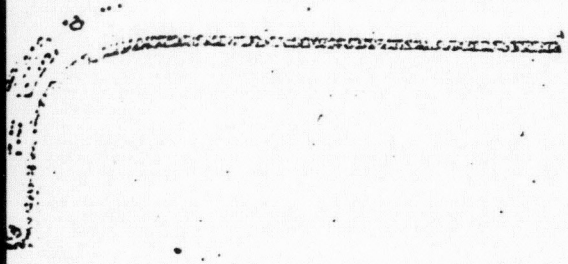
. . . lightweight bellows-type cuff inflator incorporating a non-return valve with adjustable bleed control. Obviates the need for conventional syringe and clamp.

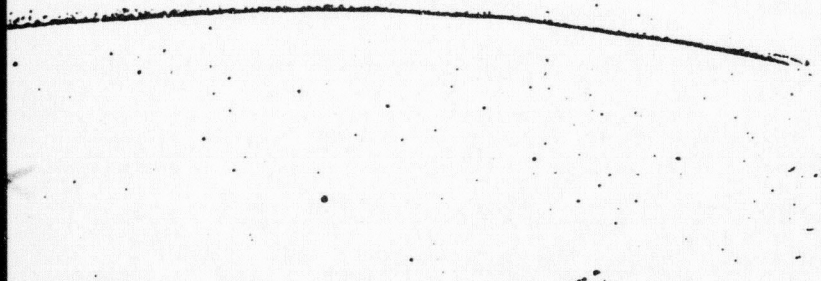
60-00021 . . . . . $7.00

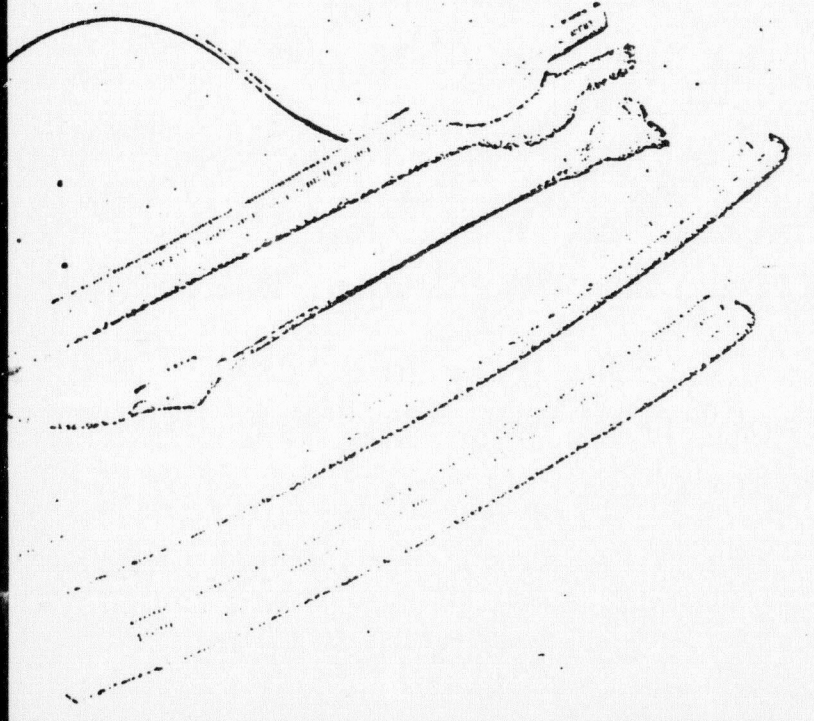
HARRIS LABS, INC.

A 4492









Oxford Non-Kinking Tube . . .
. . . internal diameter of these tubes is constant throughout but the wall thickness tapers toward the distal end. Available in a complete range of sizes, both cuffed and uncuffed. (Ref. Dr. A. F Alsop "Anesthesia" 1955, 10, 4.)

Oxford Non-Kinking, Cuffed

61-01370	7.0mm	61-01310	10.0mm
61-01380	8.0mm	61-01311	11.0mm
61-01390	9.0mm	61-01312	12.0mm

. . . . . Ea. $4.35

Oxford, Non-Kinking, Plain

61-01430	3.0mm	61-01470	7.0mm
61-01440	4.0mm	61-01480	8.0mm
61-01445	4.5mm	61-01490	9.0mm
61-01450	5.0mm	61-01410	10.0mm
61-01455	5.5mm	61-01411	11.0mm
61-01460	6.0mm	61-01412	12.0mm
61-01465	6.5mm		

. . . . . Ea. $2.00

2X-150-
2-12

Oxford Introducer . . .
. . . designed to facilitate the introduction of the Oxford Tube.

52-00099 . . . . . Ea. $3.50

Metal Spiral-Imbedded Latex Tube . . .
. . . designed to withstand considerable external pressure. Available in full range of sizes, both cuffed and uncuffed. Uncuffed also available in endobronchial length.

Uncuffed

61-04130	3.0mm	61-04170	7.0mm
61-04135	3.5mm	61-04175	7.5mm
61-04140	4.0mm	61-04180	8.0mm
61-04145	4.5mm	61-04185	8.5mm
61-04150	5.0mm	61-04190	9.0mm
61-04155	5.5mm	61-04195	9.5mm
61-04160	6.0mm	61-04110	10.0mm
61-04165	6.5mm		

. . . . . Ea. $3.45

Cuffed

61-04250	5.0mm	61-04280	8.0mm
61-04255	5.5mm	61-04285	8.5mm
61-04260	6.0mm	61-04290	9.0mm
61-04270	7.0mm	61-04210	10.0mm
61-04275	7.5mm		

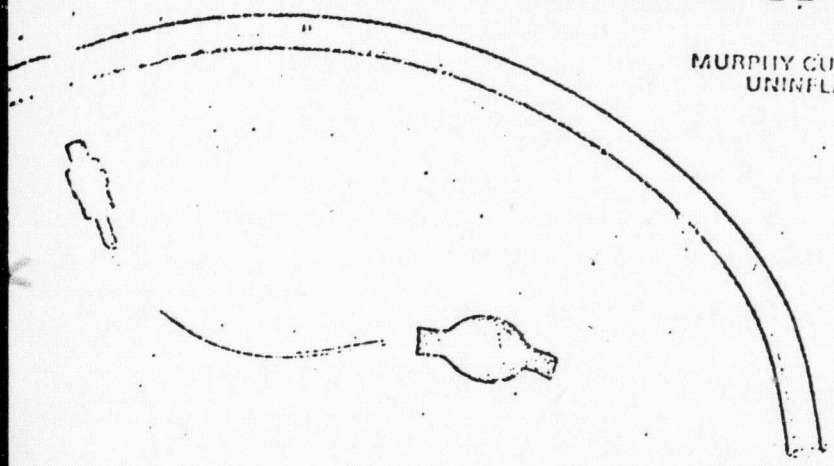
. . . . . Ea. $5.0

Endobronchial Length

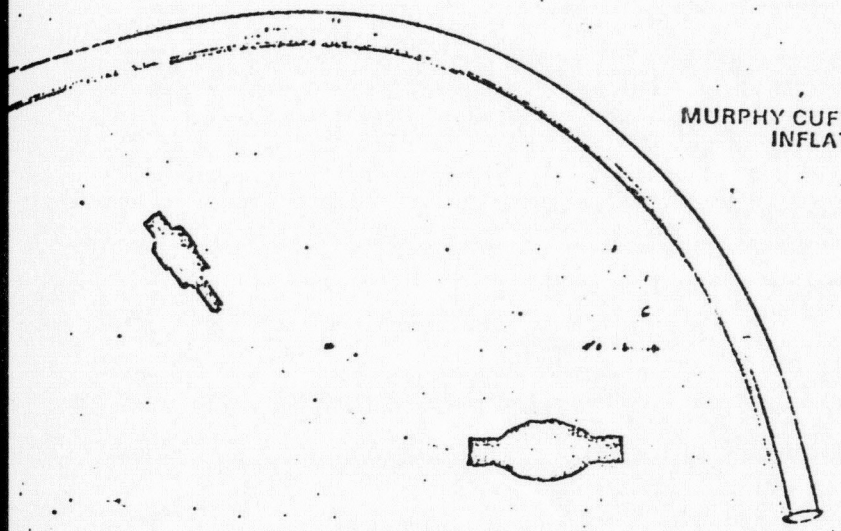
61-04350	5.0mm	61-04375	7.5mm
61-04355	5.5mm	61-04380	8.0mm
61-04360	6.0mm	61-04385	8.5mm
61-04365	5.5mm	61-04390	9.0mm
61-04370	7.0mm	61-04335	9.5mm

. . . . . Ea. $6.50

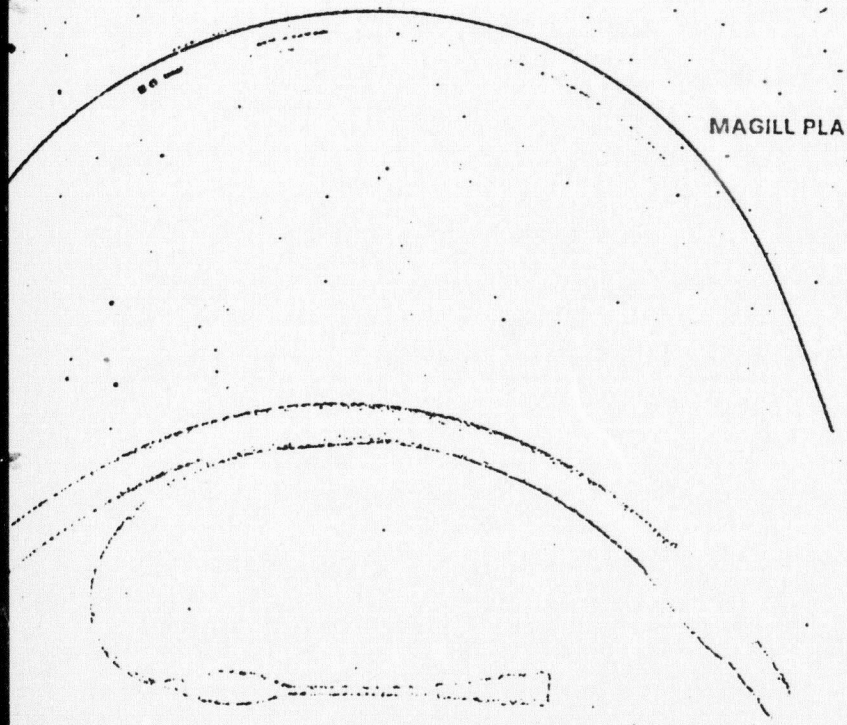
A 4493



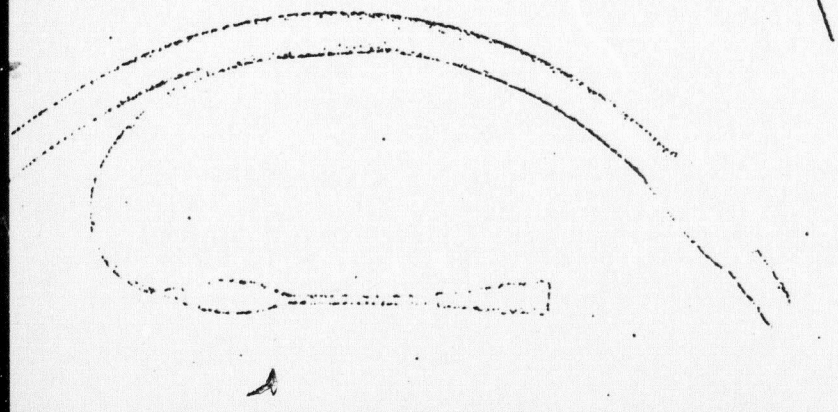
MURPHY CUFFED UNINFLATED



MURPHY CUFFED INFLATED



MAGILL PLAIN



NON-KINKING CURVED CUFFED

Tubes, Endotracheal

Harlake Single-Use, Clear Plastic Cuffed Murphy Tube . . .

. . . an improved thin wall endotracheal tube of non-toxic implant tested P.V.C. Kink resistant in normal use, incorporates a soft low-pressure cuff with large balloon contact area to avoid pressure points and minimize the possibility of trachea trauma. The inflation canal is fitted with a non-return valve. Individually sterilized, peel packaged, sterilization is by ethylene oxide.

Packed 10 tubes of one size to a box, each box includes 10 Harlake nylon connectors of the appropriate size.

61-02550	5.0mm	61-02580	8.0mm
61-02555	5.5mm	61-02585	8.5mm
61-02560	6.0mm	61-02590	9.0mm
61-02565	6.5mm	61-02595	9.5mm
61-02570	7.0mm	61-02510	10.0mm
61-02575	7.5mm	61-02511	11.0mm

1 Box (10 Tubes and Connectors) . . . . . $17.50 per box

10-90 boxes . . . . . $16.00 per box

100 boxes and over . . . . . $14.50 per box

Harlake Single-Use Clear Plastic Plain Magill Tube . . .

. . . is of similar manufacture to the 61-025 series described above but without the cuff. Can be used orally or nasally. Individually sterilized, peel packaged, with connector. Packed 10 tubes of one size to a box.

61-02625	2.5mm	61-02650	5.0mm
61-02630	3.0mm	61-02655	5.5mm
61-02635	3.5mm	61-02660	6.0mm
61-02640	4.0mm	61-02665	6.5mm
61-02645	4.5mm		

1 Box (10 Tubes and Connectors) . . . . . $10.00 per box

10-90 boxes . . . . . $ 8.00 per box

100 boxes and over . . . . . $ 6.50 per box

Non-Kinking Curved Cuffed Latex Tube . . .

. . . a precurved nylon spiral imbedded latex tube with a built-in cuff. Can be cut to length without unraveling of the nylon spiral. Designed to withstand considerable external pressure and will recover its original shape after being crushed or deformed.

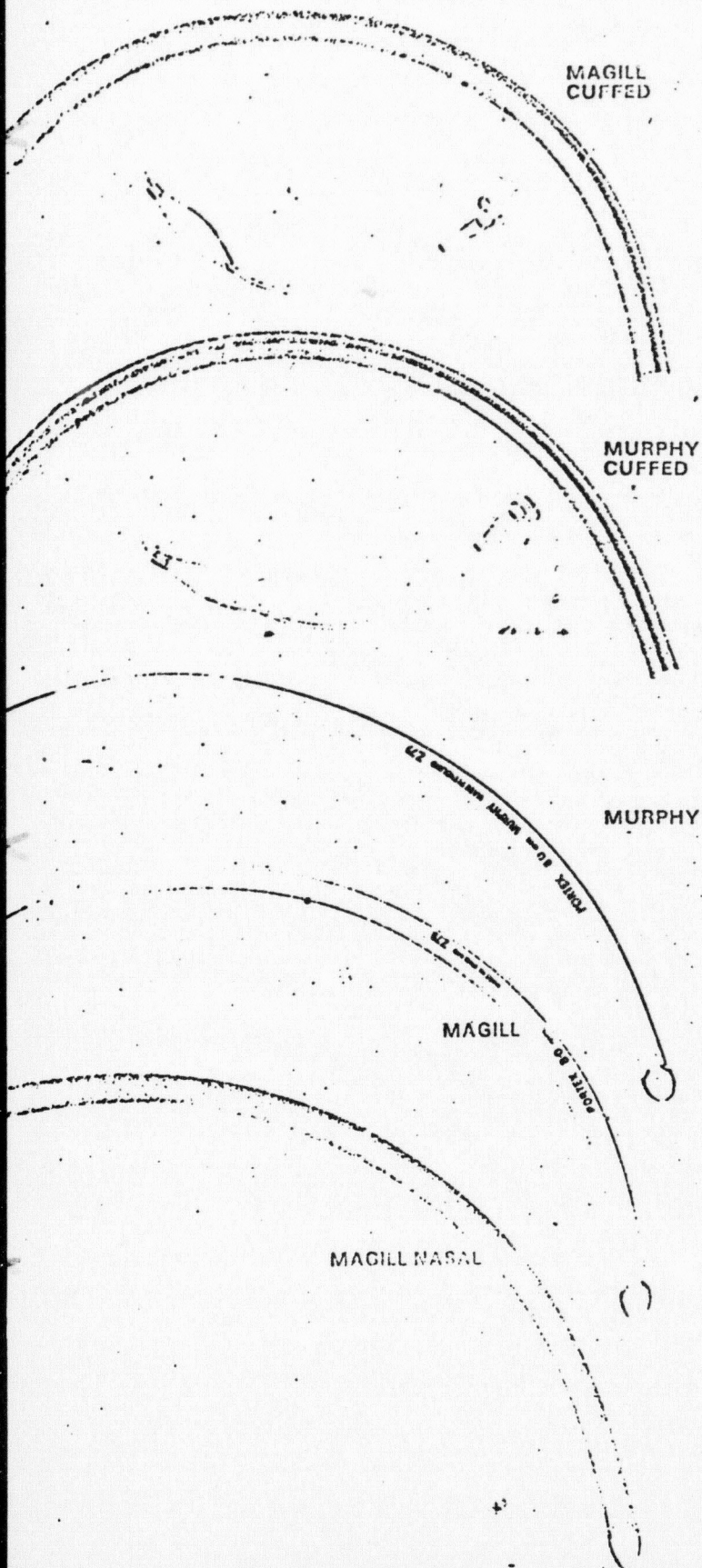
61-00050	5.0mm	61-00080	8.0mm
61-00055	5.5mm	61-00085	8.5mm
61-00060	6.0mm	61-00090	9.0mm
61-00065	6.5mm	61-00095	9.5mm
61-00070	7.0mm	61-00010	10.0mm
61-00075	7.5mm	61-00005	10.5mm

. . . . . Ea. $ 5.75

HARRIS-LAKE, INC.

A 4494

2X-150
2-14



Single-Use Blue Line Cuffed Murphy and Magill Types . . .

. . . thin wall siliconized plastic for easier insertion and suction catheterization. The tubes are implant tested, individually peel packaged with the appropriate connector, gas sterilized.

Magill

61-02350	5.0mm	61-02385	8.5mm
61-02355	5.5mm	61-02390	9.0mm
61-02360	6.0mm	61-02395	9.5mm
61-02365	6.5mm	61-02310	10.0mm
61-02370	7.0mm	61-02305	10.5mm
61-02375	7.5mm	61-02311	11.0mm
61-02380	8.0mm		

Murphy

61-02450	5.0mm	61-02485	8.5mm
61-02455	5.5mm	61-02490	9.0mm
61-02460	6.0mm	61-02495	9.5mm
61-02465	6.5mm	61-02410	10.0mm
61-02470	7.0mm	61-02405	10.5mm
61-02475	7.5mm	61-02411	11.0mm
61-02480	8.0mm		

1 Box (10 tubes) . . . . $28.00 per box
10 Boxes . . . . . $22.50 per box
50 Boxes . . . . . $19.85 per box
100 Boxes . . . . . $18.95 per box
300 Boxes . . . . . $16.85 per box

Clear Uncuffed Murphy and Magill Types . . .

. . . manufactured from non-toxic P.V.C. tubing, giving extra smooth finish, complete absence of tissue irritation. Individually peel packaged with connector, gas sterilized.

Murphy

61-01125	2.5mm	61-01170	7.0mm
61-01130	3.0mm	61-01175	7.5mm
61-01135	3.5mm	61-01180	8.0mm
61-01140	4.0mm	61-01185	8.5mm
61-01145	4.5mm	61-01190	9.0mm
61-01150	5.0mm	61-01195	9.5mm
61-01155	5.5mm	61-01110	10.0mm
61-01160	6.0mm	61-01105	10.5mm
61-01165	6.5mm	61-01111	11.0mm

Magill

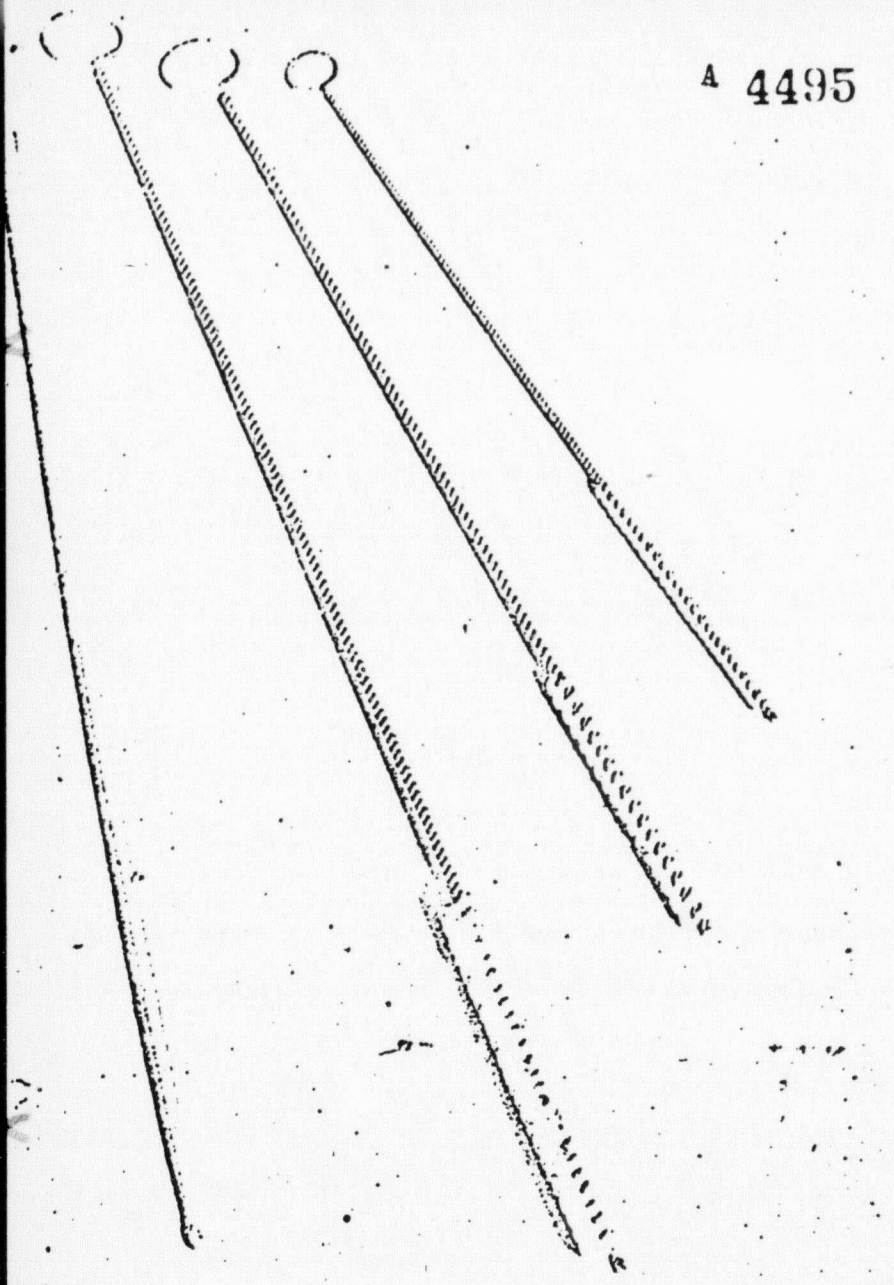
61-00825	2.5mm	61-00870	7.0mm
61-00830	3.0mm	61-00875	7.5mm
61-00835	3.5mm	61-00880	8.0mm
61-00840	4.0mm	61-00885	8.5mm
61-00845	4.5mm	61-00890	9.0mm
61-00850	5.0mm	61-00895	9.5mm
61-00855	5.5mm	61-00810	10.0mm
61-00860	6.0mm	61-00805	10.5mm
61-00865	6.5mm	61-00811	11.0mm

Ivory Opaque Nasal Tubes . . .

. . . thin-wall tubes cut with the correct (30°) nasal bevel.

61-00725	2.5mm	61-00775	7.5mm
61-00730	3.0mm	61-00780	8.0mm
61-00735	3.5mm	61-00785	8.5mm
61-00740	4.0mm	61-00790	9.0mm
61-00745	4.5mm	61-00795	9.5mm
61-00750	5.0mm	61-00710	10.0mm
61-00755	5.5mm	61-00705	10.5mm
61-00760	6.0mm	61-00711	11.0mm
61-00765	6.5mm	61-00715	11.5mm
61-00770	7.0mm		

1 Box (10 tubes) . . . . $11.00 per box
10 Boxes . . . . . $ 9.60 per box
50 Boxes . . . . . $ 8.60 per box



A 4495

CX-150-2-15

Brushes and Introducers Endotracheal

Endotracheal Tube Cleaning Brushes . . .

. . . manufactured from tufted nylon and designed for the efficient cleaning of endotracheal tubes. Available in three sizes, small, medium, and large.

52-00051	Small
52-00052	Medium
52-00053	Large

. . . . . Ea. $ .75

Gum Elastic Introducer . . .

. . . particularly suitable for use with Oxford endotracheal tubes.

	Introducer Size	Tube Size
52-00092	3	3.0- 3.5mm
52-00093	4	4.0- 4.5mm
52-00094	5	5.0- 5.5mm
52-00095	6	6.0- 6.5mm
52-00096	7	7.0- 7.5mm
52-00097	8	8.0mm
52-00098	9	9.0-11.0mm

. . . . . Ea. $3.50

Oxford Introducer . . .

. . . a rubber covered malleable introducer suitable for endotracheal tubes size 5.0mm and up.

52-00099 . . . . . Ea. $3.50

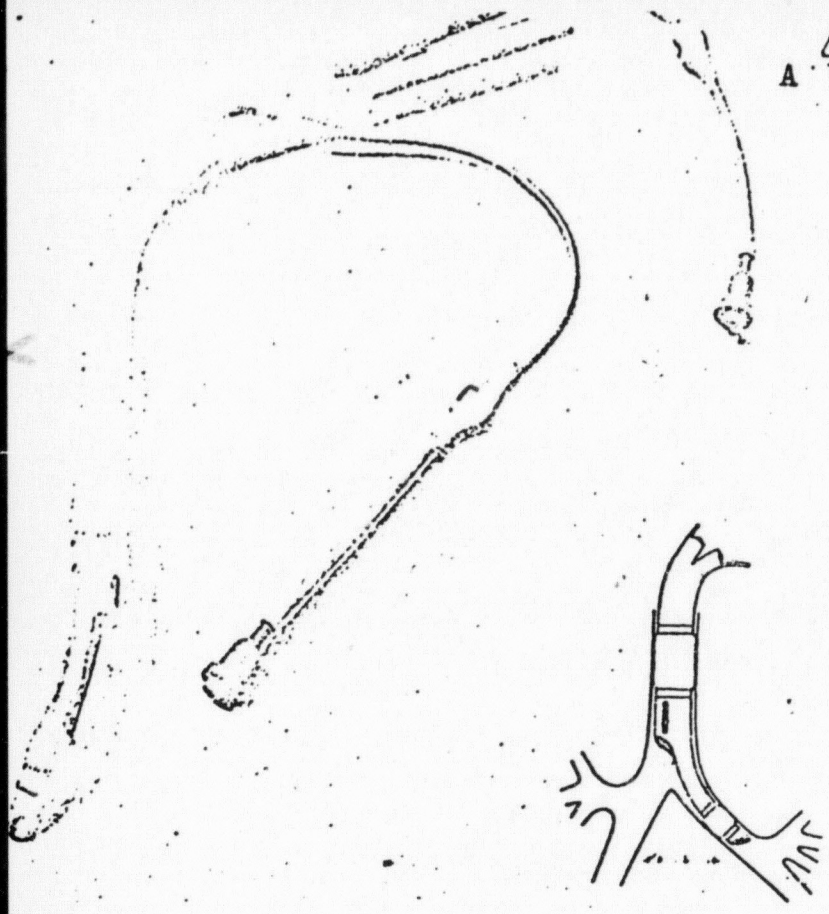
Malleable Introducer . . .

. . . a soft copper introducer, incorporating an adjustable aluminum stop.

52-00091 . . . . . Ea. $3.50

HARRIS-LAKE, INC.

A 4496 Endobronchial

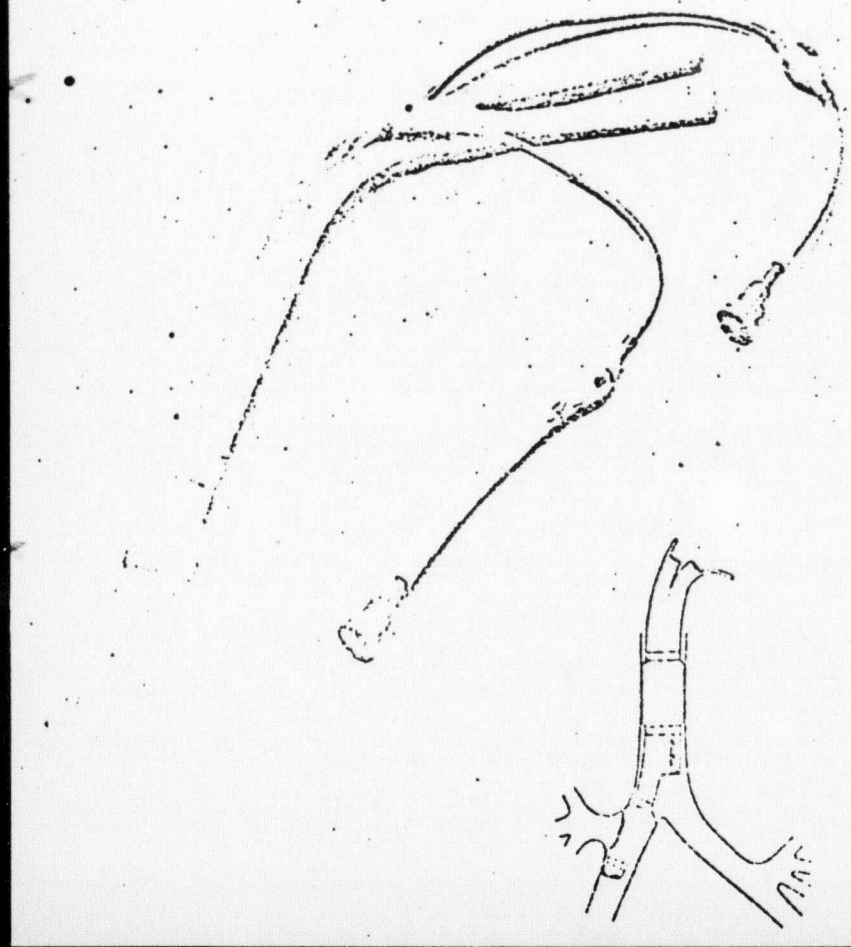


Bryce-Smith Double-Lumen Tube Left Side . . .

. . . a red rubber modified Carlens tube. Anatomically shaped, one lumen of the tube extends 7cm into the left bronchus and incorporates a cuff, the other terminates just above the carina in an open end. Slots are also cut into the tube wall and a cuff is situated just above these slots. As with the Carlens tube when both cuffs are inflated a separate airtight circuit for each lung is formed and either or both lungs can be ventilated.

61-03350	5.0mm
61-03360	6.0mm
61-03365	6.5mm
61-03370	7.0mm

. . . . . Ea. $29.00



Bryce-Smith and Salt Double-Lumen Tube Right Side . . .

. . . . a red rubber tube designed for use in the right main bronchus. Anatomically shaped and similar to the Bryce-Smith tube one lumen extends at an angle to lie in the bronchus. A cuff in this extension surrounds a rectangular slot 15mm by 4mm in the tube wall. When correctly positioned the slot lies opposite the opening of the right upper lobe bronchus and when this cuff is inflated the right upper lobe can still be ventilated with the rest of the right lung.

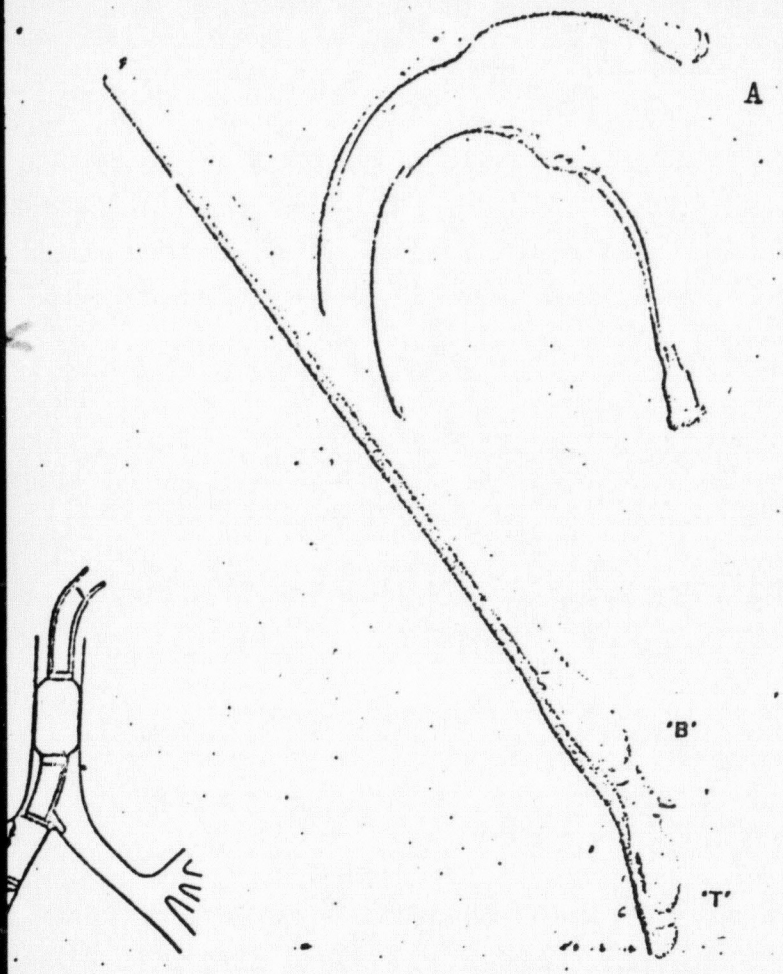
61-03450	5.0mm
61-03460	6.0mm
61-03465	6.5mm
61-03470	7.0mm

. . . . . Ea. $40.00

A 4497

2X-150-2-17

Tubes, Endobronchial

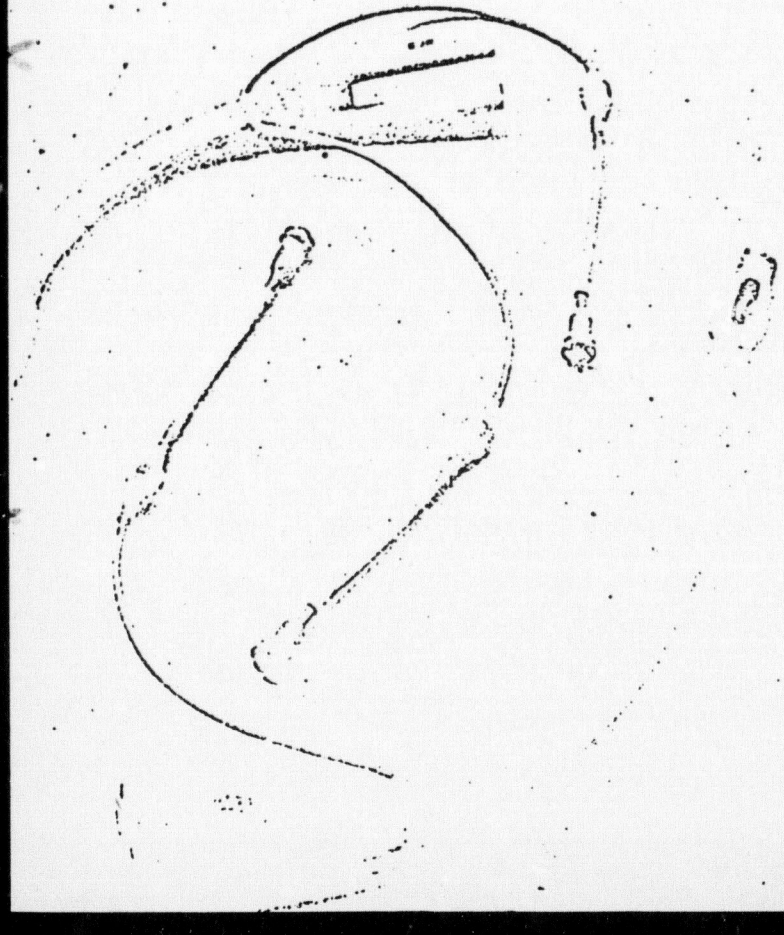


Gordon-Green Right Endobronchial Tube . . .

. . . manufactured from pure mineral rubber, designed for left lung surgery. The lower 4cm is set at an angle of 105° for ease of entry into the right bronchus. When the tube is correctly positioned the lower cuff "T" which surrounds a slotted opening in the tube wall faces the upper lobe bronchus. When this cuff is inflated the circuit is airtight and the whole right lung can be ventilated. A second cuff "B" 2cm above the carinal hook, when inflated holds the tube in place and completes the isolation of the left lung.

61-03275	7.5mm	61-03290	9.0mm
61-03280	8.0mm	61-03295	9.5mm

. . . . . Ea. $15.00



Robertshaw Double-Lumen Tube . . .

. . . available in left side and right side versions. Maximum lumen size and low flow resistance are features of the design. Both left and right side tubes are available in three sizes.

Right Side	
61-03300	Small
61-03301	Medium
61-03302	Large

. . . . . Ea. $40.00

Left Side	
61-03303	Small
61-03304	Medium
61-03305	Large

. . . . . Ea. $29.00

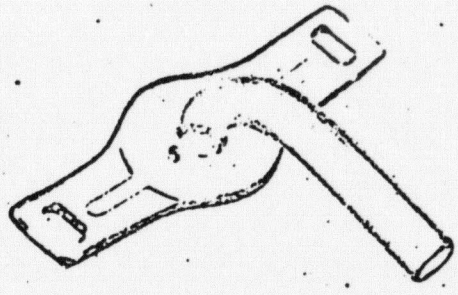
HARRIS

A 4498 Tracheostomy Tubes

Harlake Disposable Low-Pressure Cuffed . . .

. . . is manufactured in non-toxic implant tested clear P.V.C., free from irritation, sufficiently rigid without being hard and has low frictional resistance for easy passage of a suction catheter. The specially designed Low Pressure cuff inflates symmetrically with minimal air pressure but ensures complete occlusion of the free space in the trachea. The inflation canal is fully embedded into the tube wall providing a smooth internal diameter. The length reduces risk of intubation of the right bronchus. Flange is adjustable and the distal end is a 15mm male fitting incorporating a P.V.C. swivel section for positive retention with the breathing circuit connection. Individually sterile packed.

62-00621	.....21FR	
62-00624	.....24FR	
62-00627	.....27FR	
62-00630	.....30FR	Ea. $5.25
62-00633	.....33FR	
62-00636	.....36FR	
62-00639	.....39FR	
62-00642	.....42FR	

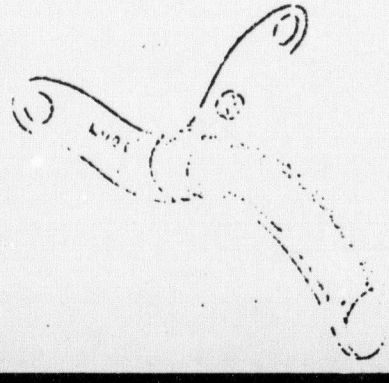


Morrant-Baker, Uncuffed . . .

. . . is molded in transparent non-toxic P.V.C. designed primarily for long term use, lightweight. Individually packed with cotton tapes, sterile, ready for use.

62-00321	.....21FR	
62-00324	.....24FR	
62-00327	.....27FR	
62-00330	.....30FR	Ea. $2.25
62-00333	.....33FR	
62-00336	.....36FR	
62-00339	.....39FR	
62-00342	.....42FR	

(Tracheostomy Tube Cuffs, see Pg. 33)

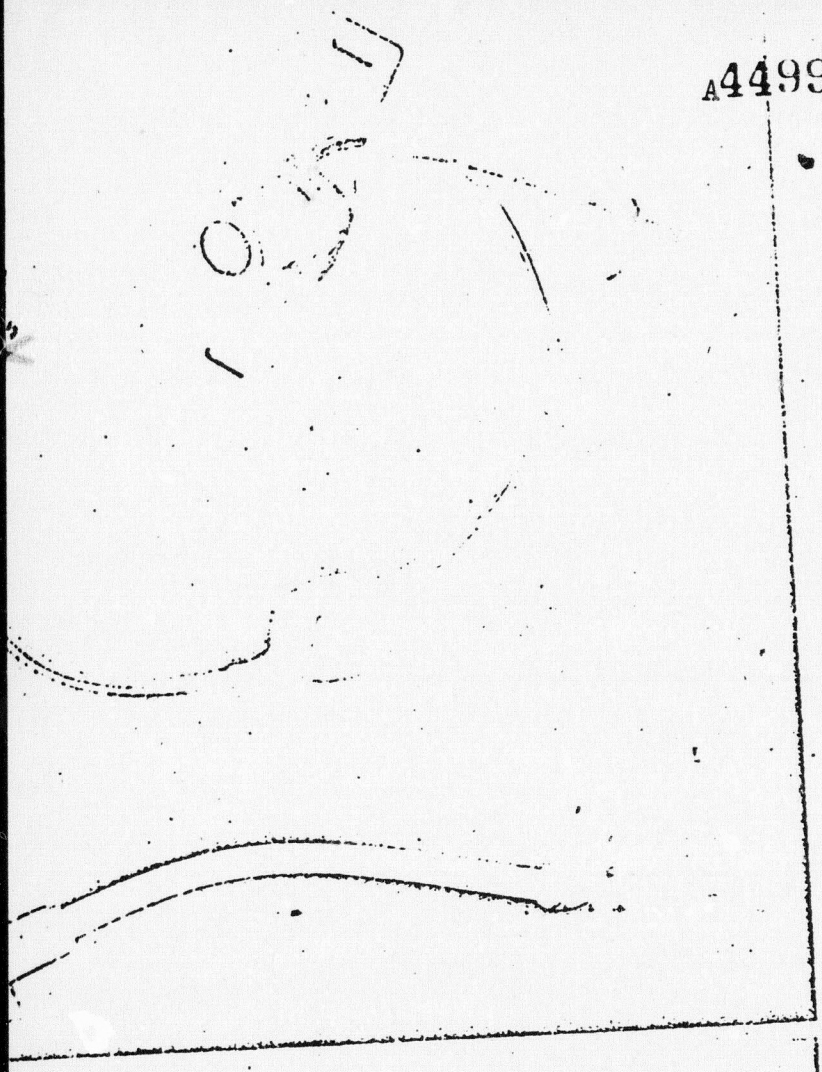


Infant (Gt. Ormand St. Hospital) . . .

. . . was developed at the world famous Great Ormand St. Hospital for Sick Children, London. Molded in non-toxic P.V.C. anatomically shaped for the newborn, infant and young children. Individually sterile packed.

62-00435	.....3.5mm	
62-00440	.....4.0mm	
62-00445	.....4.5mm	Ea. $2.50
62-00450	.....5.0mm	
62-00455	.....5.5mm	
62-00460	.....6.0mm	
62-00470	.....7.0mm	

A4499 Tracheostomy Tubes



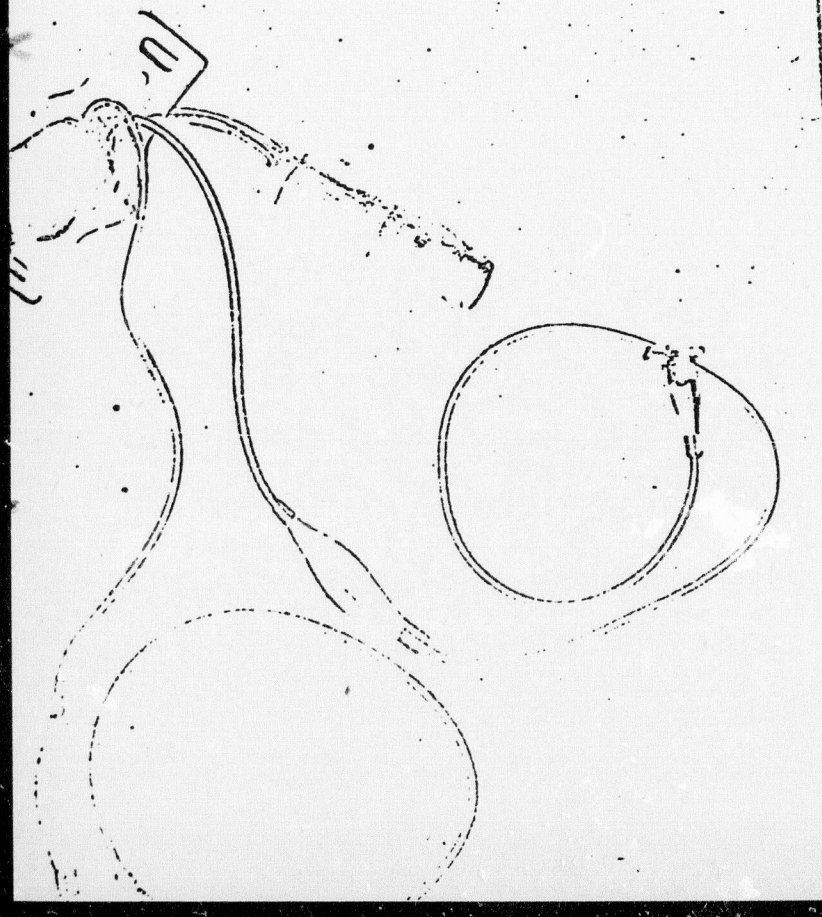
Disposable Blue Line Cuffed . . .

. . . smooth, soft, built-in cuff minimizes pressure on tracheal wall. Greatly reduced wall thickness allows maximum lumen and gas flow while maintaining flexibility and kink resistance. Obturator supplied for ease of insertion. Inflation channel incorporated in wall of tube prevents lumen reduction and formation of crustations. 15mm termination with built-in swivel component connects directly to respiratory circuit or additional swivel connector. Tube material is implant tested for tissue compatability and long term tracheostomy denoted by Z-79 marking. Individually peel packaged, gas sterilized, with cotton tapes included. Supplied 10 tubes of one size to a box.

62-00524	.....24FR	
62-00527	.....27FR	
62-00530	.....30FR	
62-00533	.....33FR	$75.00 Per Box
62-00536	.....36FR	
62-00539	.....39FR	
62-00542	.....42FR	

10 Boxes of 10 assorted sizes

.....$72.00 Per Box



Salpekar Double Cuff . . .

. . . suitable for long term use. Each cuff may be individually inflated alternately, avoiding prolonged localized pressure on the tracheal wall, maintaining a constant block to the inspiration of pharyngeal secretions. Manufactured from non-toxic P.V.C., the cuffs inflate symmetrically. Individually packed with cotton tapes and 15mm double male connector, sterilized ready for use. Satisfies U.S.P. XVII Page 905 modified implantation test.

62-00127	.....27FR	
62-00130	.....30FR	
62-00133	.....33FR	ea. $ 7.00
62-00136	.....36FR	
62-00139	.....39FR	
62-00142	.....42FR	

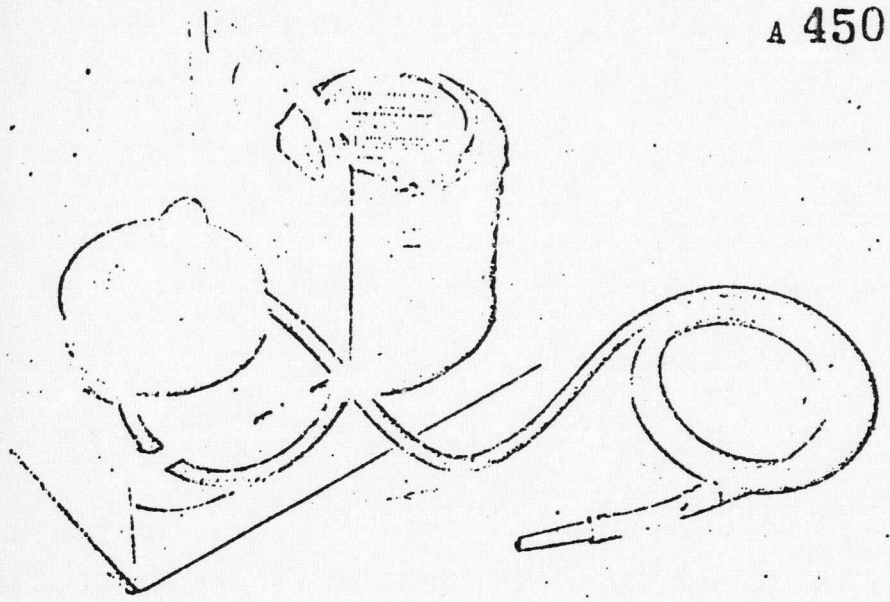
HARRIS-LAKE, INC.

Manufacturers of Surgical Medical Equipment

A 4500

Resuscitators Manual

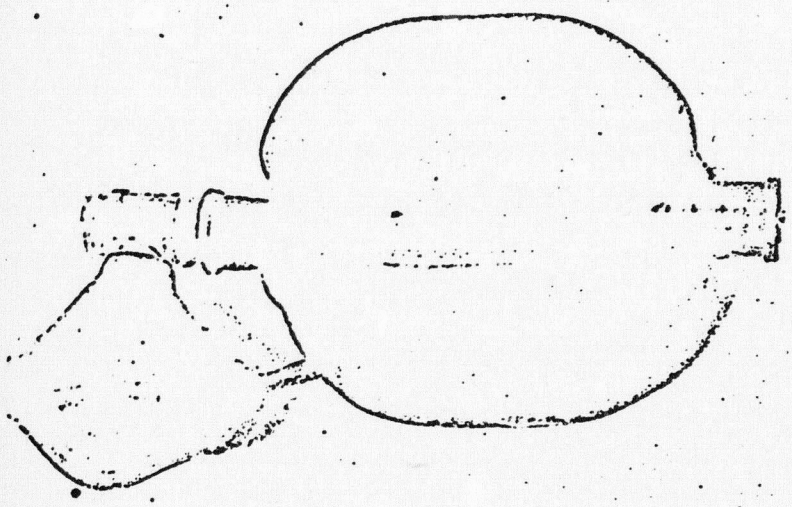
2x-150-2-20



Ambu Suction Pump . . .
. . . is a foot operated bellows type suction pump designed for use with the "Ambu" Resuscitator. Invaluable for the removal of mucus and other foreign matter from the upper airway prior to resuscitation.
Unit consists of a bellows type foot pump and suction trap. Easily dismantled for cleaning.

64-00051 . . . . . Ea. $45.00

Replacement parts and accessories.
64-00052 Aspirator Bottle . . Ea. $ 2.00
64-00053 Pump Bellows Assembly . . . . . Ea. $27.40



Ambu with Pouch . . .
. . . corresponds to the bag and mask used in anesthesia to control respiration. The "Ambu" bag incorporates a foam rubber inner lining which allows the bag to be inflated with atmospheric air automatically. Provision is made for the addition of Oxygen if required. The "Ambu" Resuscitator has been adopted worldwide as standard equipment by armed forces, Civil Defense, hospital and first-aid organizations.

64-00001 . . . . . Ea. $49.50

Replacement parts and accessories.
51-00102 Valve Shutter-E2 Valve . . . . . Ea. $ 5.60
64-00002 Resuscitator Pouch . . . . . Ea. $ 3.05
64-00003 Ambu E2-Valve . . Ea. $20.75
64-00005 Neoprene Bag . . . Ea. $17.95
64-00006 100% Oxygen Adapter . . . . . Ea. $ 9.00
64-00009 Case Single (For Resuscitator or Pump) . . . Ea. $13.00
64-00010 Case Double (For Resuscitator and Pump) . . Ea. $17.00

Blease Samson Neonatal Resuscitator . . .
(Ref. Samson H. H. Medical Proceedings 9, 158, 1963).
. . . specially designed to ventilate safely the lungs of the newly born baby and initiate breathing at birth. It can be used on the smallest premature infant or on a large full term baby. It may be used with a mask, endotracheal tube or through a tracheostomy opening. It can be used on a baby who is not breathing at birth or who needs respiratory assistance during the neonatal period.

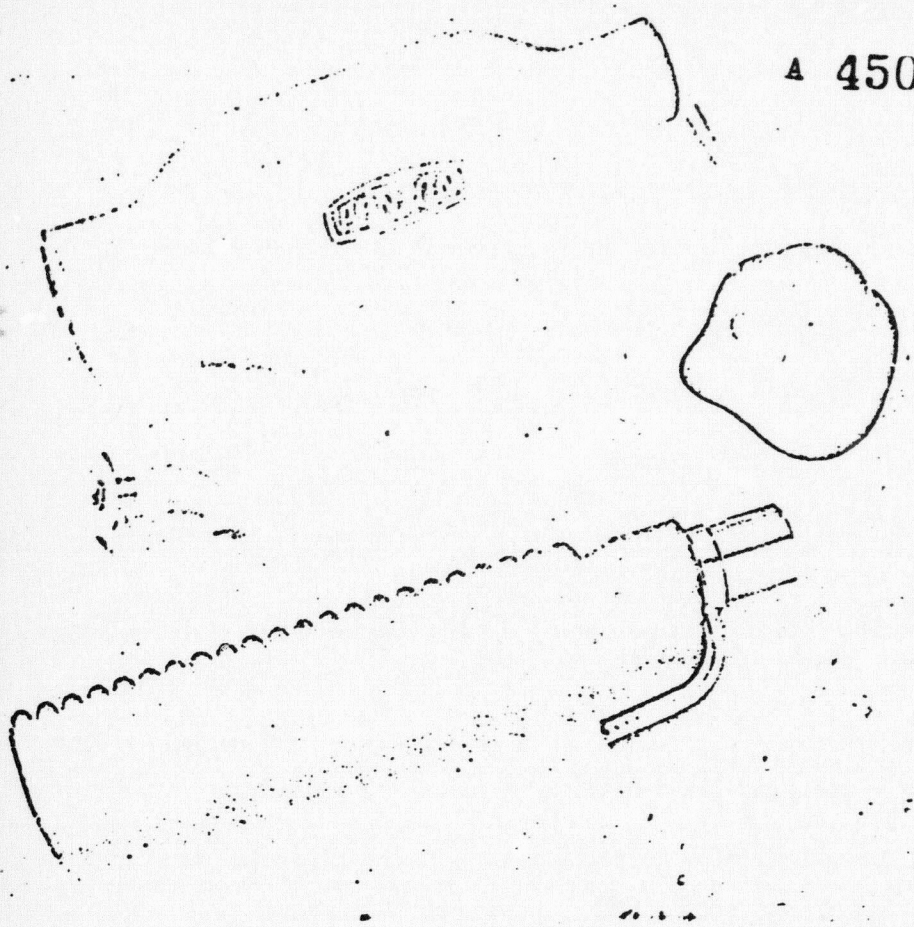
64-00150 . . . . . Ea. $18.50

Resuscitators

Manual –

EX-159-
2-21

A 4501



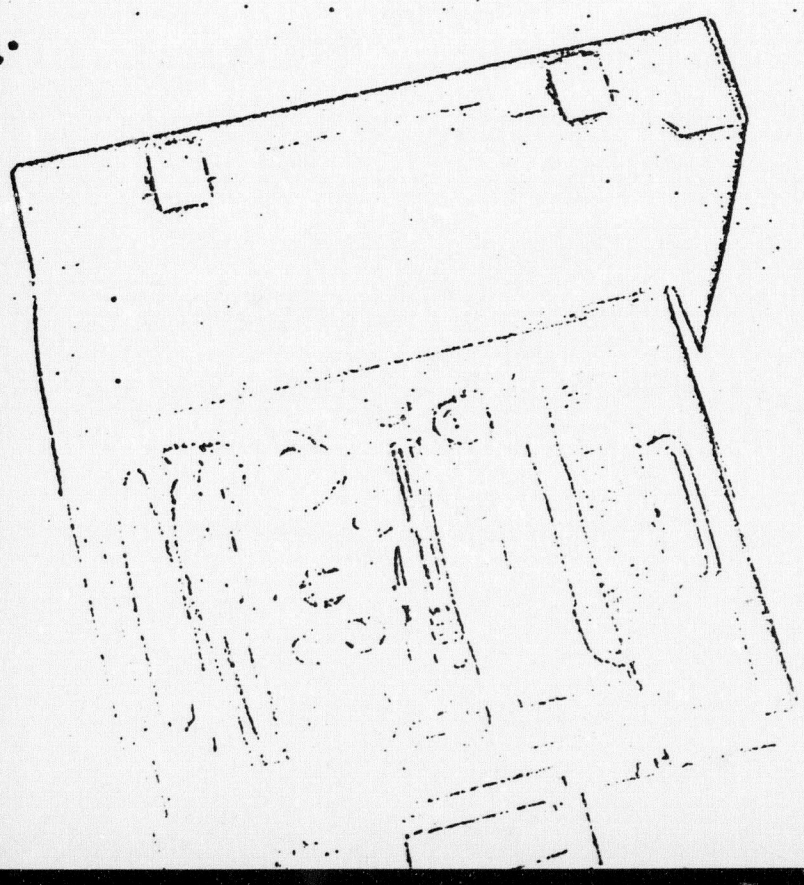
Cardiff Infant Inflating Bag . . .

. . . is supplied complete with neonatal airway and mask, oxygen reservoir tube and carrying case. The self-filling bag is thin-walled rubber which transmits to the user's finger-tips a high degree of 'Feel' indicative of pressure and volume changes. The 250 ml. capacity bag can provide up to 125 ml. at each compression. The inflating valve incorporates a designed leak keeping the ventilating pressures within safe limits for all conditions of the lungs, from unexpanded to fully expanded. An oxygen reservoir tube, provided, can be fitted to the bag inlet, this tube is open to atmosphere and prevents oxygen flows from increasing the bag pressure or locking of the valve in the inflating position.

64-00200 . . . . . Ea. $47.50

Replacement Parts

64-00201 Rubber Bag $12.50
64-00202 Inflating Valve $18.00
64-00203 Oxygen Reservoir Tube . . . . . $ 4.50
64-00204 Tube Connector . . . . $ 8.50
64-00205 Carrying Case . . . . . $ 4.50
54-00010 Facemask Size 0 . . . . $ 6.50



Cardiff Bag Hospital Kit . . .

. . . is an emergency neonal resuscitation set, complete with carrying or wall-mounted case. The kit consists of the Cardiff Resuscitator, 2 size facemasks and airways, endotracheal tube connector and 2 neonatal endotracheal tubes. Macrae mucus extractor, Miller Infant Laryngoscope Blade and penlite handle, spare laryngoscope batteries and bulbs.

64-00226 . . . . . Ea. $145.00

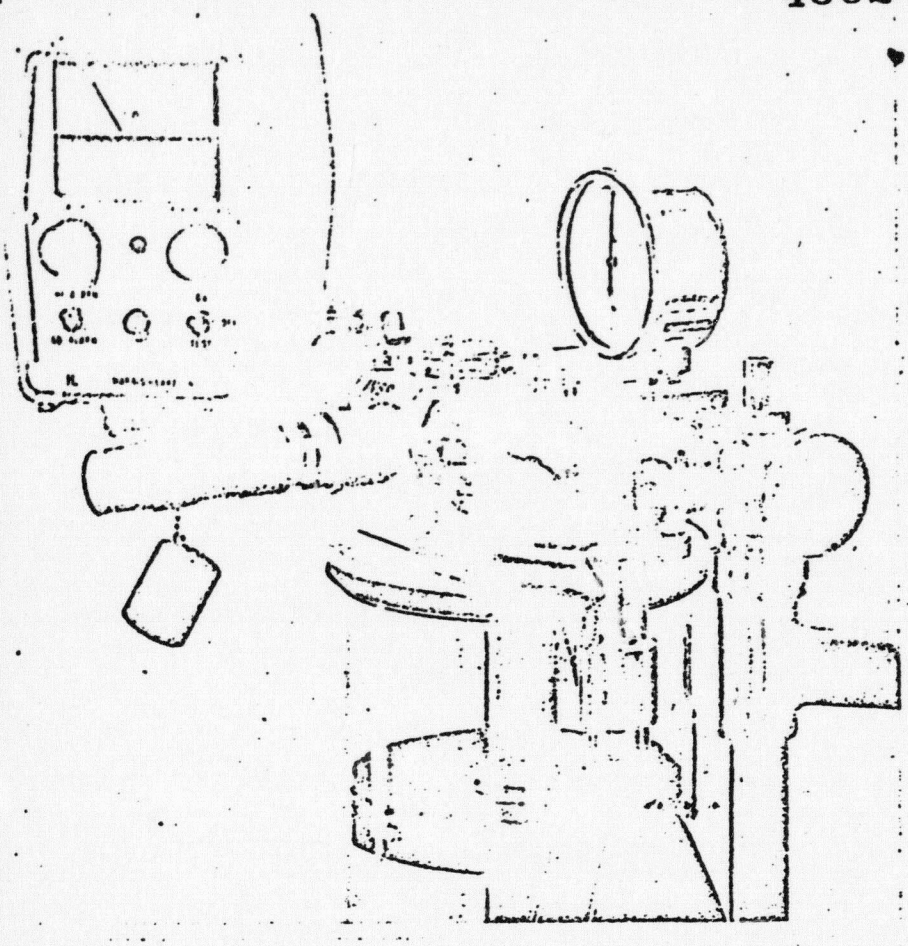
HARRIS-LAKE, INC.

A 4502

Monitoring

Equipment

DIRECT READING OXYGEN ANALYZERS

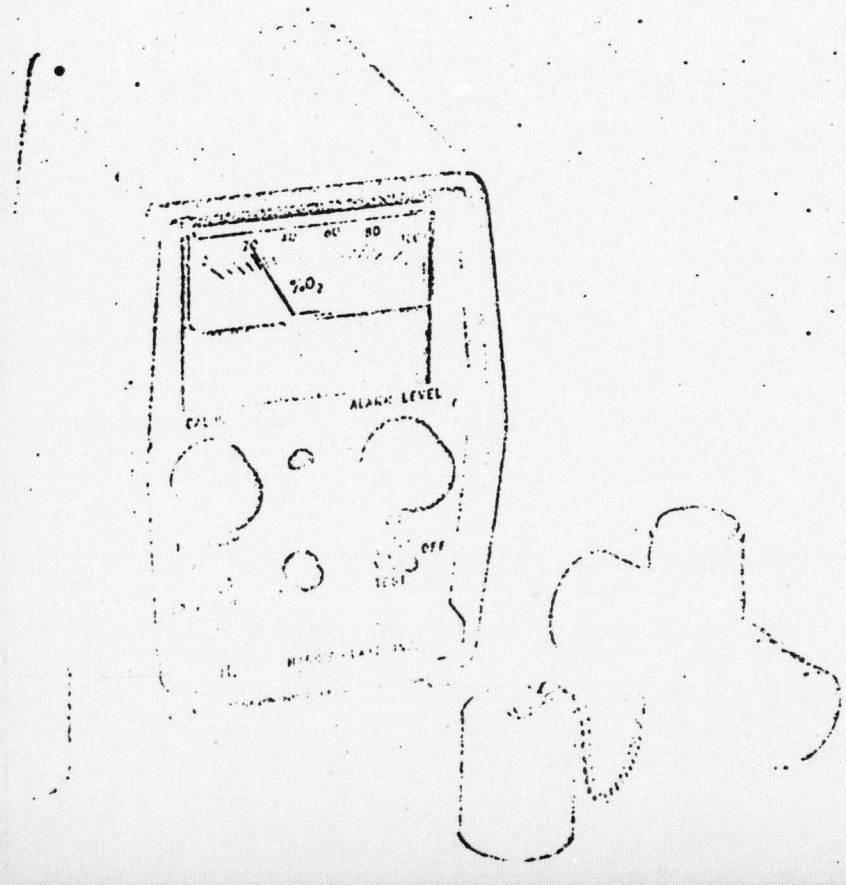


Harlake Combined Oxygen Anaylzer and Alarm System . . .

. . . a compact lightweight (24 ounces) continuous oxygen monitor with audible and visual alarm system for use in tents and incubators with I.P.P.B. equipment and ventilators, in fact, wherever the continuous monitoring of oxygen percentage is desirable.

Of special importance is its use in Anesthesia. When placed in the inhalation side of a breathing system, it will continually monitor the oxygen content of the patient's inspired volume relative to the total flow of gaseous and vaporized agents. It is our opinion that this continual monitoring of oxygen content, expressed as a percentage of total gas flow, in combination with mechanical fail-safe devices incorporated in most anesthesia machines closely approaches the ultimate in "fail-safe" systems.

Considerable thought has gone into the design of the Harlake oxygen anaylzer relative to various use applications. The result is an all-purpose unit, embodying the most desirable features at a price sufficiently attractive to encourage its use with all equipment designed to dispense life support gases.



SPECIFICATIONS:

Range 0-100% Accuracy ± 2% scale

Response Time 90% in 26 seconds (C-1 cell)
90% in 7 seconds (B-1 cell)

Alarm System Audible and visual with selection switch for high or low alarm operation

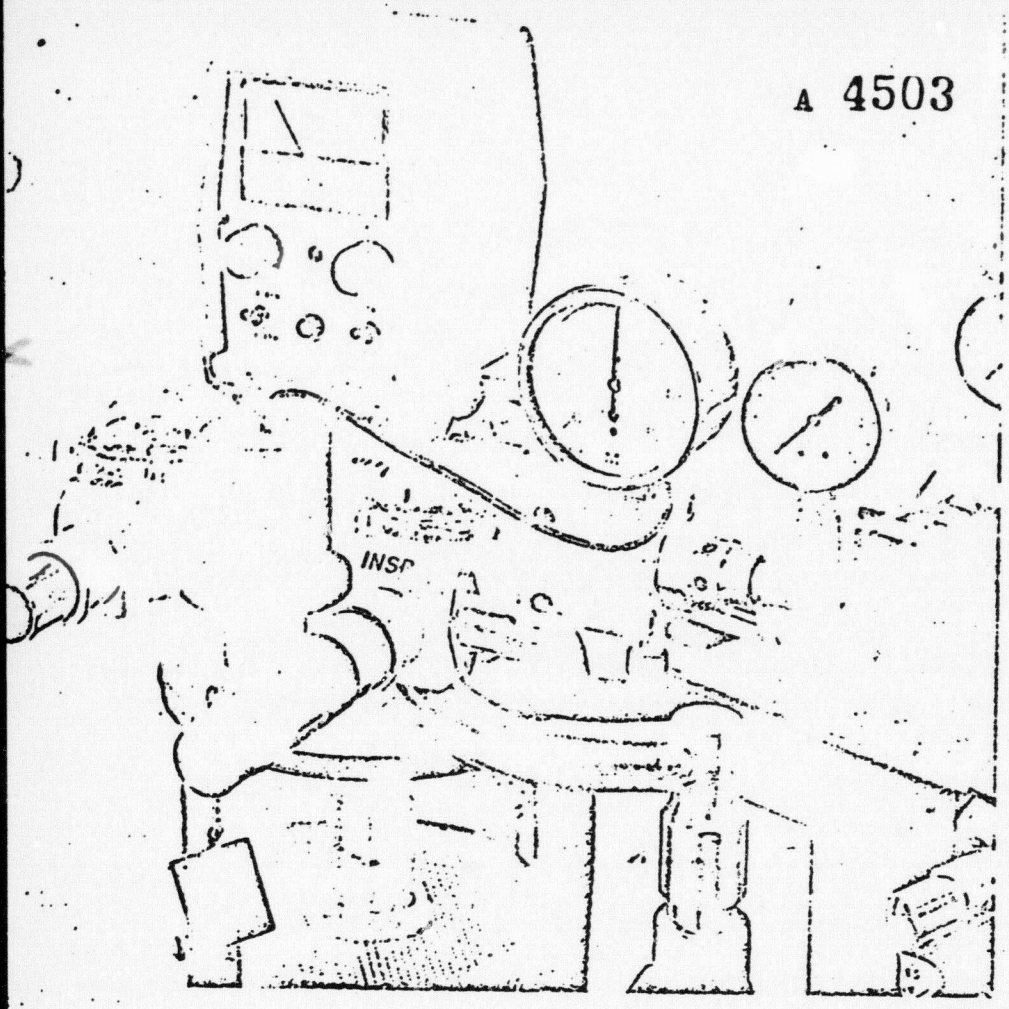
Power Sources Four 1.5 V "AA" cells (6.0 V total) providing 50 hours continuous alarm. Batteries power alarm only. Meter read-out is powered by microfuel cell and operates irrespective of battery condition. Battery test circuit is incorporated.

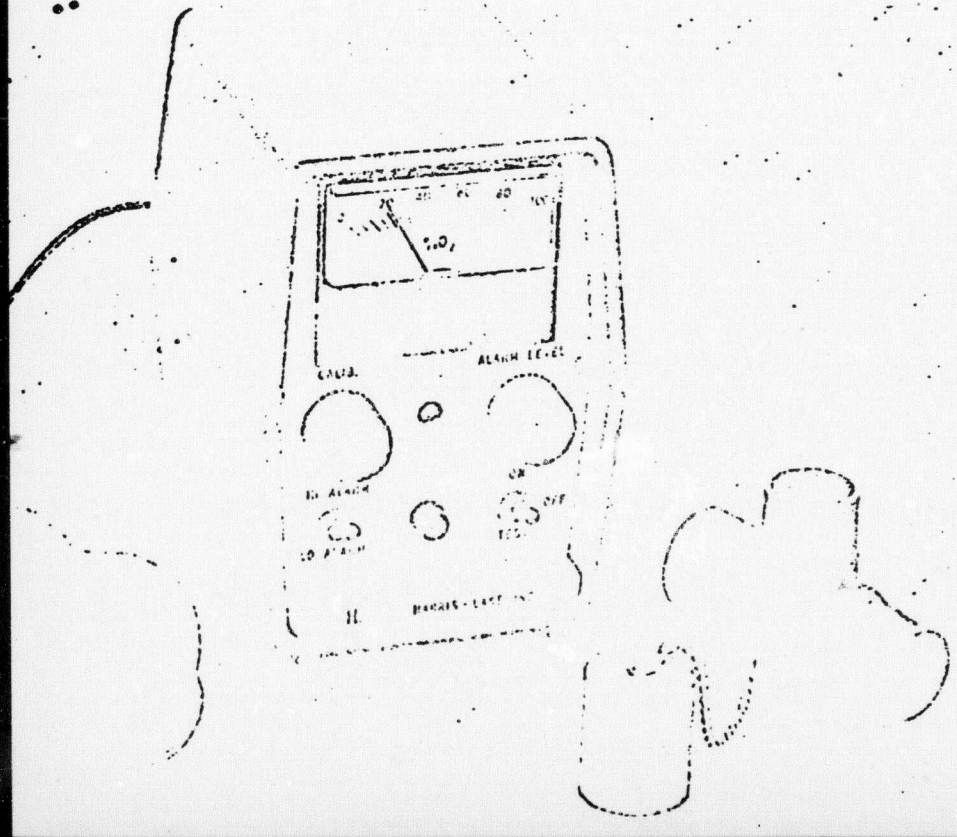
(Specifications continued on next page)

Temperature Compensation Automatic over a range 0-40° C (32-104° F)

Monitoring Equipment

A 4503





SPECIFICATIONS — CONTINUED

Controls

"On-Off Test"
"High Alarm" — "Low Alarm"
"Calibrate" (room air or 100% O_2)
"Alarm Level"
Push Button — "Alarm Read"

High or low alarm settings are made directly on the meter scale by pushing the 'Alarm Read' button and simultaneously setting the desired reading on the meter by means of the 'Alarm Level' control. Alarm setting can be checked any time by pushing the 'Alarm Read' button.

Microfuel Cell and Probe Assembly

The Microfuel Cell is located in a remote dual purpose probe assembly having a self-coiling lead. The probe and lead can also be housed in the body of the instrument so that it will operate as a free standing unit.

Probe assemblies can be supplied for either the quick response class B-1 cell or the longer lasting C-1 cell. Both cell types are pressure compensated.

Dimensions 3½" x 5" x 4¼", weight 24 ozs.

66-00471 Harlake Oxygen Analyzer and Alarm (C-1 Cell) . . . . Ea. $325.00
66-00472 Harlake Oxygen Analyzer and Alarm (B-1 Cell) . . . . Ea. $325.00

Adapters . . .

. . . If the analyzer is to be used in a breathing circuit either directly, with probe assembly in recessed or remote system, the following adapters will be required.

66-00454 Female Adapter 22mm . . . . . Ea. $ 3.00
66-00455 Capped 'T' circuit adapter 22mm . . . . . Ea. $ 7.50

Replacement Cells

66-00453 Class C-1 (240,000% hrs.) . . . . . Ea. $ 50.00
66-00462 Class B-1 (80,000% hrs.) . . . . . Ea. $ 50.00

Replacement Probe Assembly (Less Cell) . . . . . .

66-00454 For C-1 Cell . . . . Ea. $ 62.00
66-00454 For B-1 Cell . . . . Ea. $ 62.00

Mounting Bracketry . . .

. . . Universal mounting brackets for the semi-permanent mounting of the analyzer to most types of equipment are also available.

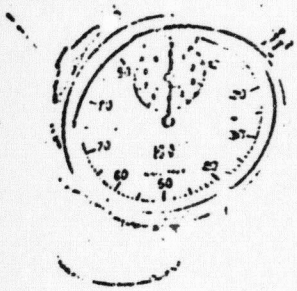
HARRIS-LAKE, INC.

Manufacturers of Quality Medical Equipment

A 4504

Monitoring Equipment

RESPIROMETERS



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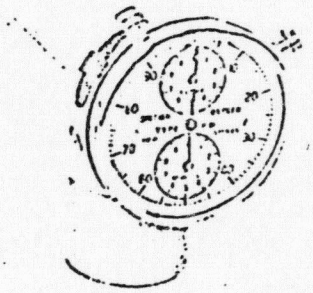

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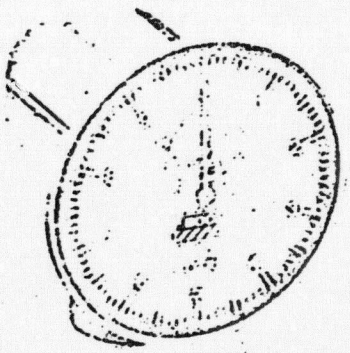


C

A
Wright Respirometer Mark 8 . . .

. . . has a watch face type dial 1½" in diameter protected by a clear plastic cover plate. The periphery of the dial is marked in 100 divisions with the numerals 10, 20, etc., at the appropriate intervals. One complete revolution of the hand indicates a volume of 100 liters. A smaller scale on the upper part of the main dial is marked in 100 divisions with the numerals 1, 2, etc., at the appropriate intervals. One complete revolution of the hand of this small dial indicates a volume of 1 litre. A spring-loaded button for resetting the hands to the zero positions, and an on/off control in the form of a sliding stud, are mounted on the outside of the instrument. The overall dimensions of the chromium plated brass housing are 2½" x 2¼" and the weight of the instrument with three adapters, less case, is 5¼ oz.

66-00201 . . . . . Ea. $275.00

B
Wright Respirometer— Physiological Model . . .

. . . Is similar to the standard Wright Respirometer in all respects except that it has a third dial which records up to 10,000 liters.

66-00202 . . . . . Ea. $325.00

C
Wright Respirometer Mark 12— Extended Dial . . .

. . . Is similar in function to the standard model but with a 2¼" extended dial for easier reading. The gearing mechanism has been modified so that one sweep of the large hand registers 1 liter and the small hand of the inset dial records cumilatively to 100 liters.

66-00203 . . . . . Ea. $287.50

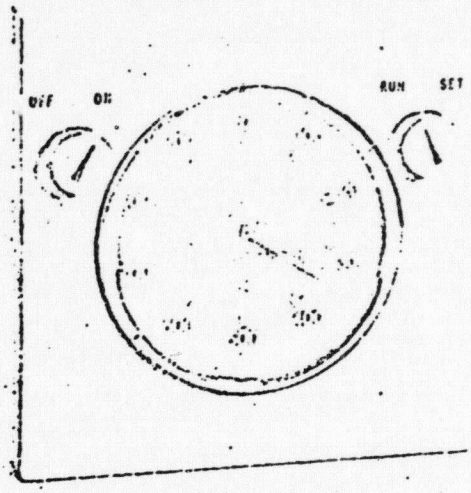
All models supplied in protective zippered case with 3 adapters and safety harness.

66-00206 Harness . . . . . Ea. $ 2.25
66-00225 Zippered Case . . Ea. $12.50
51-00009 Adapter, Female 22mm . . Ea. $ 5.40
51-00010 Adapter, Male 22mm . . . . Ea. $ 5.40
51-00013 Adapter, Catheter . . . . . Ea. $ 3.50

A 4505

Monitoring Equipment

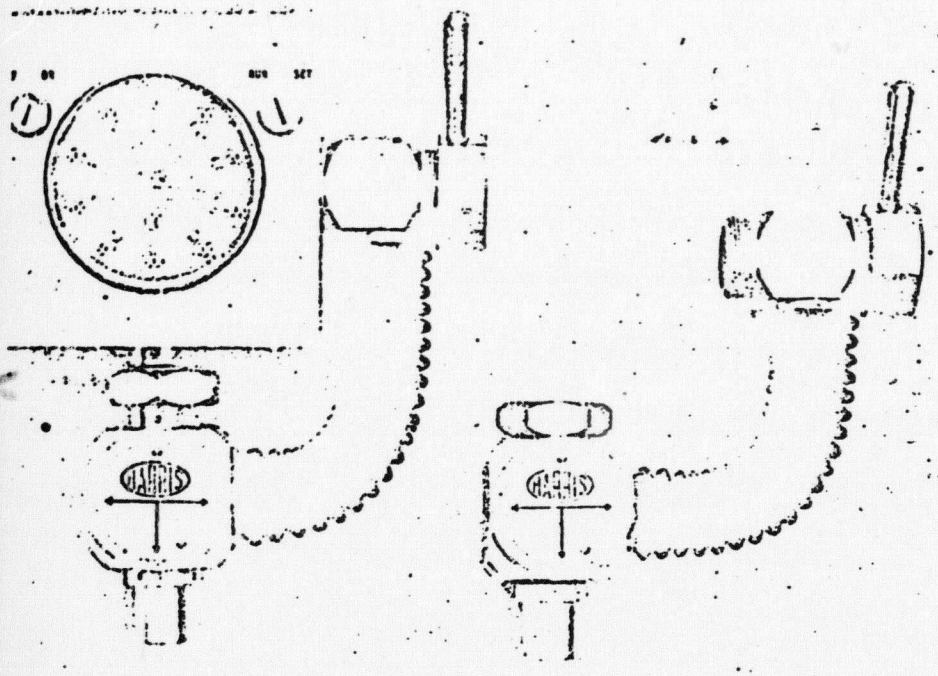
RESPIROMETERS, ATTACHMENTS, STETHOSCOPES



Wright Respirometer, Panel Mounting Model . . .

. . . is ideally suited for panel mounting. The exhalation port can be located in any one of four positions. Similar in operation to the extended dial model, one revolution of the large sweep hand records cumulatively to 100 liters. A specially designed by-pass attachment is available enabling the unit to be directly attached to the exhalation side of an anesthetic circuit. In normal use the exhaled gases would by-pass the unit but by turning the control knob these gases can be directed through the respirometer.

66-00204 . . . . . Ea. $350.00

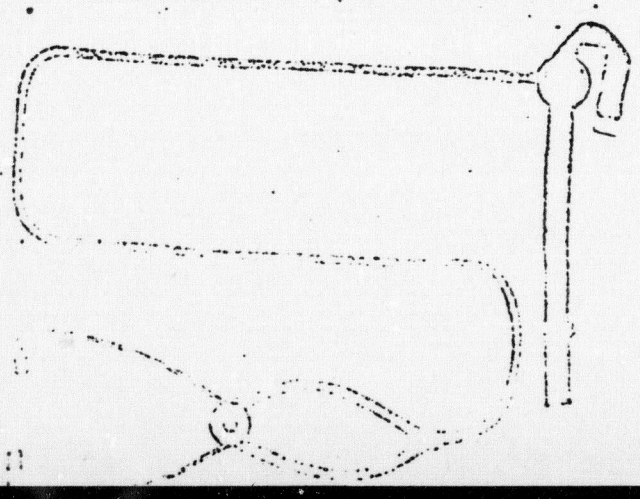


Respirometer By-Pass Attachment . . .

. . . is designed to be attached to the exhalation valve assembly of a carbon dioxide absorber. In normal use the control valve is set so that the exhaled gases by-pass the respirometer. By turning the control knob these gases are directed through the respirometer. The by-pass attachment can be used with all models of the Wright Respirometer.

Note Since absorber designs vary please state make and model when ordering.

66-00205 . . . . . Ea. $ 95.00



Brachial Stethoscope . . .

. . . incorporates a plastic brachial chest piece, which is so shaped that it may be slipped between the arm and blood pressure cuff, where it is securely retained in position above the brachial artery. A light webbing strap is provided should independent attachment be desired.

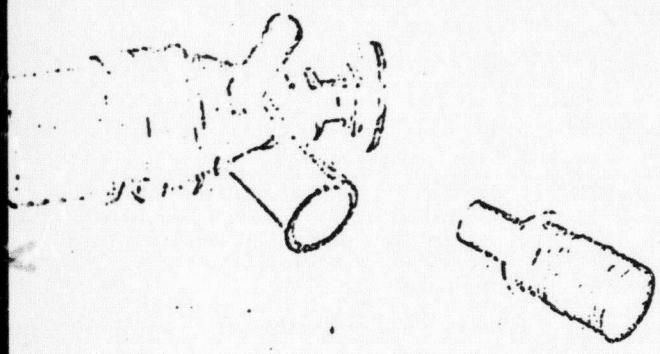
66-00301 . . . . . Ea. $ 9.95

HARRIS-LAKE, INC.

Manufacturers of Surgical Instruments

A 4506

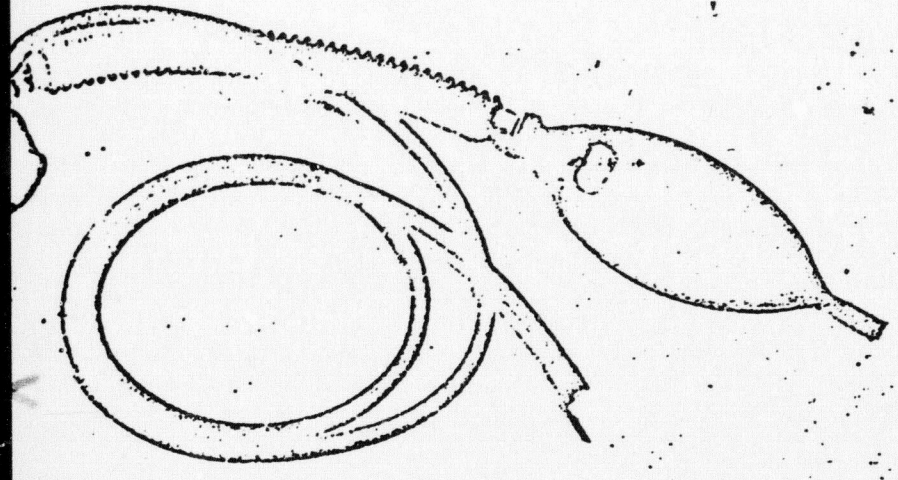
Equipment



Pediatric Swivel Facemask Elbow . . .

. . . is a small lightweight plastic facemask elbow incorporating a leakfree swivel 22mm male facemask mount with a 15mm female internal bush, side inlet gas feed and captive plugged port for suction or manual resuscitation. A small expiratory valve can also be plugged into the port in place of the plug-cap.

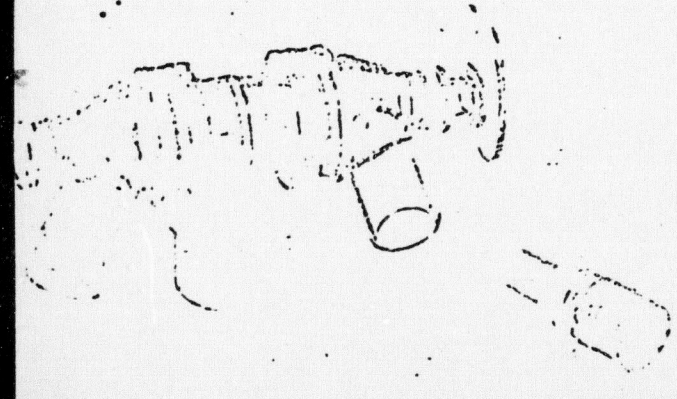
64-00302 . . . . . Ea. $ 8.50
64-00307 Expiratory Valve Assembly . . . . . Ea. $10.50



Mapleson Modified Ayres Technique . . .

. . . incorporates an open ended bag in lieu of expiratory valve, facemask swivel elbow of clear plastic incorporating removable plug cap for suctioning or manual resuscitation. Extension corrugated tube permits bag to be held clear of infant's head.

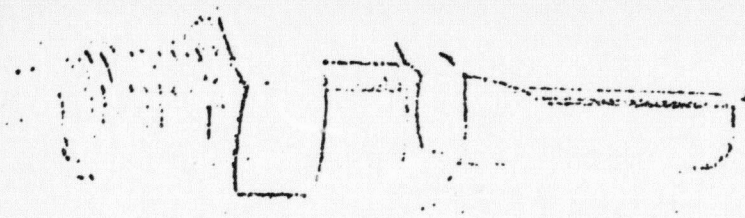
64-00301 . . . . . Ea. $34.50
Components:
64-00302 Swivel Facemask Elbow . . . . . Ea. $ 8.50
64-00303 Bag & Hose Adapter Female 15mm . . . . . Ea. $ 3.
64-00304 Hose Adapter Male 15mm . . . . . Ea. $ 3.75
64-00305 Corrugated Breathing Hose 12" x 5/8" . . . . . Ea. $ 3.00
53-00002 Bag, Open Ended, ½ Liter . . . . . Ea. $ 4.25
64-00306 Gas Feed Tube and Mount . . . . . Ea. $ 3.00
54-00011 Rendell-Baker Mask, Size 1 . . . . . Ea. $ 6.50



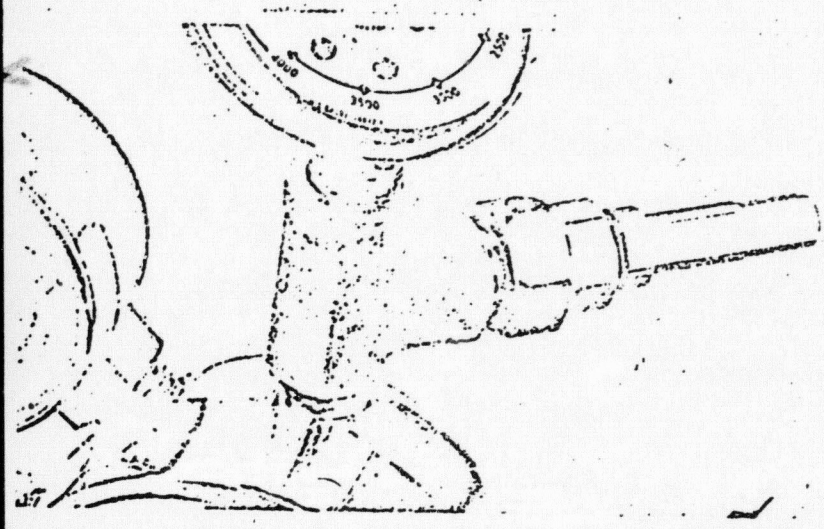
Pediatric Swivel 'Y' Connector . . .

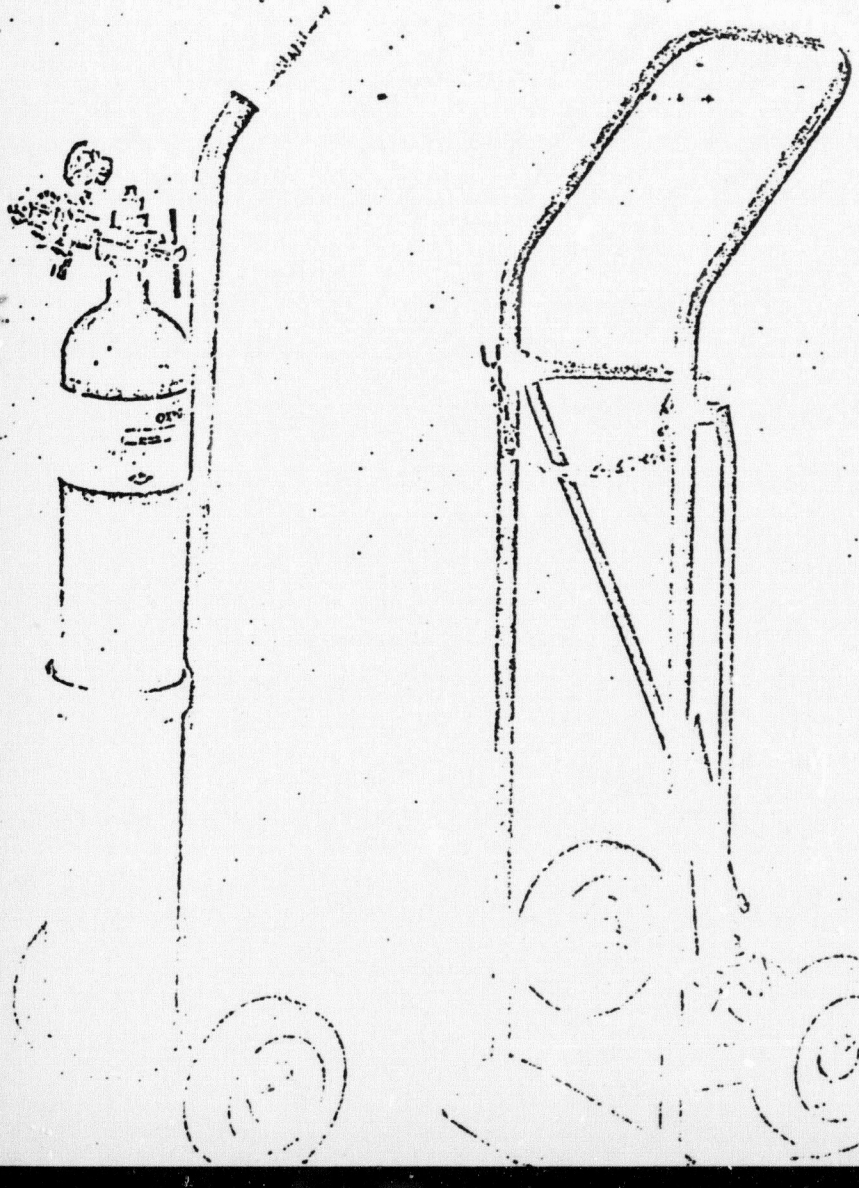
. . . is a lightweight plastic swivel 'Y' connector, the two male limbs incorporating 15mm male tapers. A capped port is located on one limb and will accommodate an expiratory valve is required.

64-00308 . . . . . Ea. $15.50
64-00307 Expiratory Valve Assembly . . . . . Ea. $10.50



A 4507





Warning Whistles

Cylinder Trucks

EX-150-
2-27

Audible Warning Whistle . . .

. . . a simple warning device for attachment directly into the high pressure side of an oxygen regulator. Whistle will blow when cylinder pressure reaches a dangerously low level. No provision is made to cut out the sound, but whistle can be muted by means of adjustable plastic sleeve. Two models are available. a 90 P.S.I. version for direct attachment to the oxygen regulator of an anesthetic machine and a 250 P.S.I. version as illustrated, for use with oxygen therapy regulators.

35-00051 Whistle 90 P.S.I. . Ea. $ 9.50
35-00052 Whistle 250 P.S.I. Ea. $ 9.50
35-00053 High pressure 'T' Connector for Therapy Regulator . . . . Ea. $12.50

Therapy Oxygen Cylinder Truck . . .

. . . welded for greater strength. A four-wheel cylinder truck with 8" front wheels and 3" retractable rear wheel assembly.

35-00101 . . . . . Ea. $48.95

Small Cylinder Oxygen Truck . . .

. . . welded for greater strength. Designed to accommodate 'D' or 'E' size cylinders. Six inch wheels for greater mobility.

35-00102 . . . . . Ea. $18.95

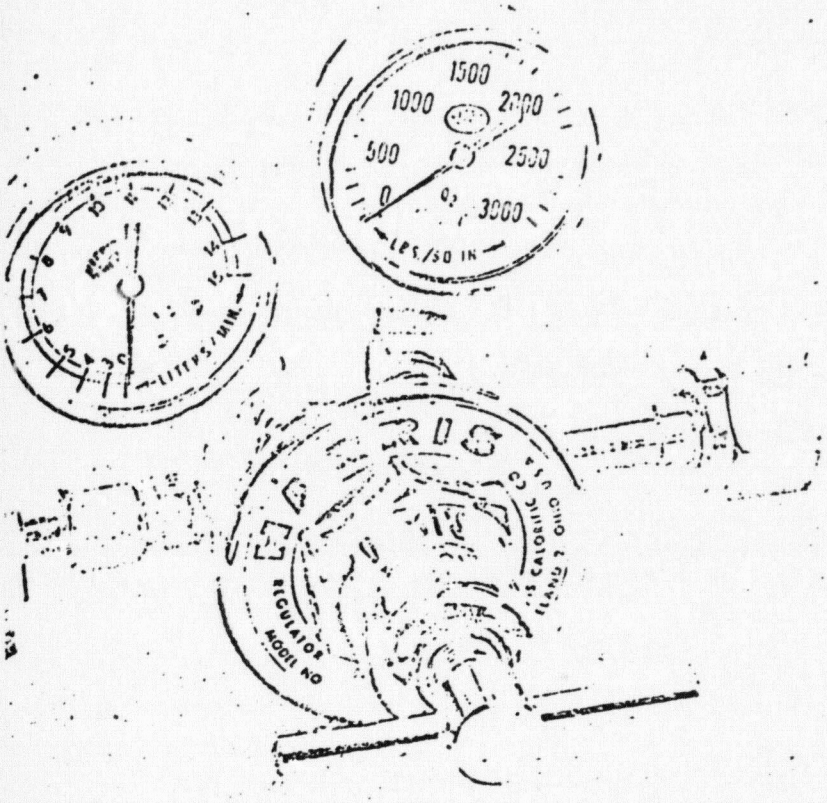
HARRIS LABEL INC.
Manufacturers of Printed Tags

A 4508

Gas Regulating Equipment

HARLAKE MEDICAL REGULATORS

- Precision machined from heavy duty brass forgings
- Diaphragm assemblies have internal tamper-proof relief devices
- Extreme accuracy throughout the whole flow range—only one L.P.M. flow variation from full to empty cylinder content
- Finished in bright nickel chrome

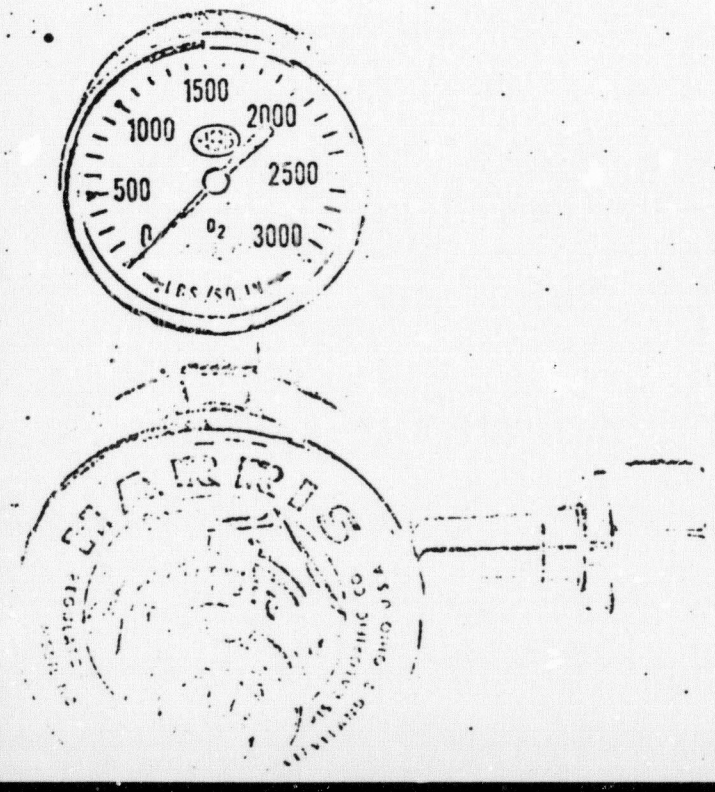


Single Stage 15 L.P.M. Metering Regulator . . .

. . . has a large 2¾" diaphragm for accurate flow control, and 2" screw-front gauges with shatter-proof lenses. Combination of a low rate spring, bronze bushing and a stainless steel adjusting screw provides for easy flow control.

35-00001 Oxygen Metering Regulator
CGA #540 Inlet . . . . . Ea. $49.50

35-00002 Oxygen/Carbon Dioxide 95%-5% Metering Regulator
CGA #280 Inlet CGA #1200
D.I.S.S. Outlet . . . . . Ea. $52.50



Single-Stage Pre-set 50 P.S.I. Regulators . . .

. . . are similar in design to the 35-00001 Metering Regulators but pre-set for 50 P.S.I. delivery pressure. Ideally suited for operating Anesthesia and I.P.P.B. equipment from large cylinders.

35-00004 Oxygen Regulator, Pre-set 50 P.S.I.
CGA #540 Inlet . . . . . Ea. $45.00

35-00005 Nitrous Oxide Regulator, Pre-set 50 P.S.I
CGA #1320 Inlet
#1040 D.I.S.S. Outlet . . . . Ea. $49.00

35-00006 Carbon Dioxide Regulator, Pre-set 50 P.S.I.
CGA #320 Inlet
#1080 D.I.S.S. Outlet . . . . Ea. $49.00

A 4509

Gas Regulating Equipment

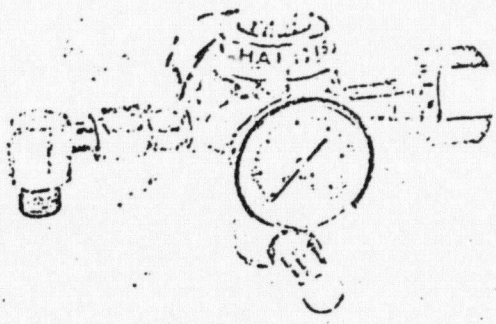
Ex-150-2-21

HARLAKE MEDICAL REGULATORS

Single-Stage 15 L.P.M. Oxygen Flowmeter Regulator . . .

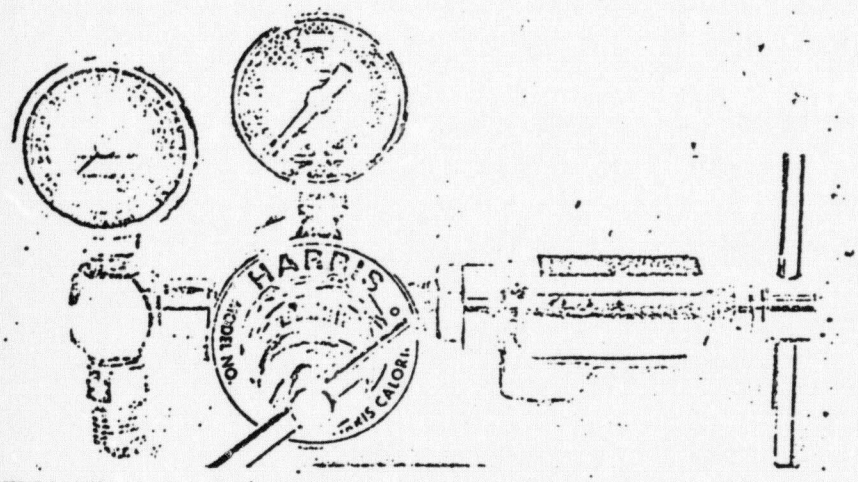
. . . . a new design, compact flowmeter regulator. Needle valve designed for sensitive adjustment at low flows and rapid adjustment for high volume. Forged brass body with recessed pressure gauge.

35-00007 Oxygen Flowmeter Regulator
CGA #540 Inlet . . . . . Ea. $65.00

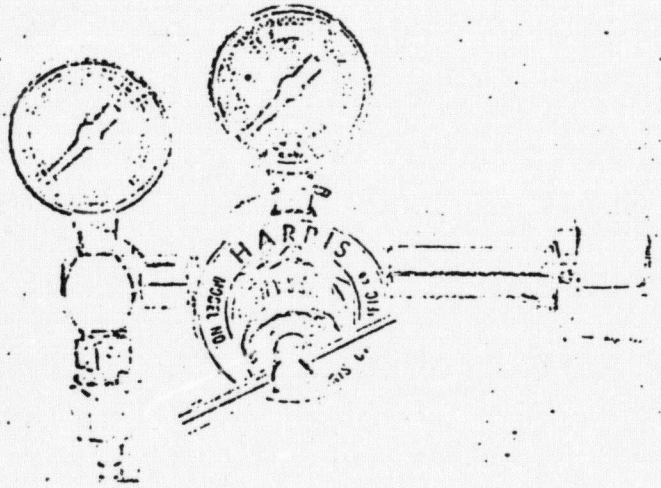


Small Single Stage Regulators

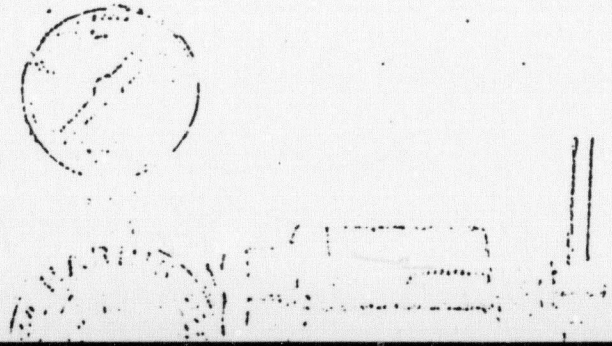
- For use with standard and pin-indexed post type valves
- Regulator body 1¾" and the gauges 1½" in diameter
- Equal in performance to the standard size regulators
- Ideally suited for use with portable breathing equipment where size and weight must be kept to minimum



35-00011 Oxygen Metering
Regulator 0-15 LPM
CGA #870 connection for pin-indexed cylinder valves . . . . . Ea. $42.00



35-00012 Oxygen Metering
Regulator 0-15 LPM
CGA #540 connection for therapy oxygen cylinders . . . . . Ea. $38.00



35-00013 Oxygen Regulator
Pre-set 50 P.S.I.
CGA #870 Inlet . . . . . Ea. $39.00

35-00014 Oxygen Regulator
Pre-set 50 P.S.I.
CGA #540 Inlet . . . . . Ea. $35.00

HARRIS-LAKE, INC.

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A 4511

EX-1.50-
2-31

Warranty

The Company warrants each new product or part thereof to be free from defects in workmanship and materials. If any part thereof shall prove to be defective in workmanship or materials within one year from the date of purchase by the user, as a result of normal use and service for purposes for which it was intended, as determined by the Company, the Company will replace the part or parts so determined by it to be defective with new parts, at Company's cost and expense. This warranty is exclusive and there are no other warranties or representations, expressed or implied.

In respect to items of a disposable nature or others of rubber or plastic the warranty is limited to the freedom from defects in both material and workmanship at the time of delivery.

With respect to the above, we comply with Fair Labor Standards Act of 1938, as amended. We are not responsible after delivery to common carrier. Any discrepancies must be reported immediately upon receipt of goods. Return no goods without written permission.

TERMS: 1% 10 days, net 30 days from date of invoice.

PRICES: Prices and specifications are subject to change without notice and are quoted F.O.B. Factory.

RETURNED GOODS: Goods will not be accepted for credit after 30 days from original purchase and on all but defective merchandise will be subject to a re-stocking charge of 15%.

Effective February 29, 1972

A 4512

EX-150-
2-32

"I wish no living thing
to suffer pain"

Percy Bysshe Shelley

Briggs Road, Cleveland, Ohio 44111 / Telephone (216) 251-5870
TWX (810) 421-8368

AIRCO MANAGEMENT NEWSLETTER A 4513

CX-170-A

JANUARY 14, 1974

BRITISH OXYGEN'S TENDER OFFER WAS SUCCESSFUL; NOW OWNS APPROXIMATELY 35 PER CENT OF AIRCO'S OUTSTANDING COMMON STOCK; CURTISS-WRIGHT'S TENDER FAILED.

The British Oxygen Company was successful in its tender offer for 4.0 million shares of Airco common stock at $20.00 per share. The final tally showed that just under 6.2 million shares of Airco stock were properly tendered to BOC. However, because BOC's authorization from its Board of Directors and from the Bank of England was to acquire a maximum of 4.0 million shares, BOC could only accept about 64.6 per cent of the 6.2 million shares tendered, and had to return nearly 2.2 million (or 35.4 per cent) of the total shares received. BOC's 4.0 million shares represent about 35.3 per cent of Airco's 11,325,000 shares of common stock outstanding as of December 10, 1973.

Curtiss-Wright's tender offer was unsuccessful. It first offered to buy up to 2.4 million shares (or approximately 21 per cent of Airco's outstanding common stock) at $18.00 a share, but only 462,752 shares were tendered. C-W then extended and amended its tender proposal and offered to purchase up to 5.7 million shares (or 50.3 per cent of the outstanding Airco stock) at $18.00 a share. However, C-W wasn't obligated to take any of the additional shares acquired unless it acquired the full 5.7 million shares (and it fell far, far short of that total). Following the failure of its amended offer, C-W tendered to BOC the 462,752 shares it (Curtiss-Wright) was required to purchase as part of its initial tender offer. Under its pro-rata formula, BOC accepted 299,035 shares of the Airco stock tendered by C-W and returned the remaining 163,717 shares which Curtiss-Wright as of this date, apparently still owns.

* * * * * * * * * * * * * * * *

HOW THE 64.6% PRO-RATA FORMULA WORKS

If you tendered these Airco shares to BOC	*You will receive $20 per share for these*	*And these shares will be returned to you*
50	32	18
100	65	35
150	97	53
200	129	71
275	178	97

CX-170-B

NOTE FROM EDITOR: Understandably, Airco employees are deeply concerned as to how BOC's 35 per cent ownership of Airco stock will affect them as well as the division and corporate operations.

At the suggestion of Mr. Dillon and Mr. Giordano, we contacted key Airco division executives and requested they summarize the most significant and frequent questions their people are asking in regard to the current and future relationships between Airco and BOC.

Following is a general roundup of those questions, and the answers by Airco's chairman and president.

WILL THERE BE ANY MAJOR CHANGES IN THE WAY WE ARE NOW ORGANIZED OR IN OUR OPERATIONS?

Mr. Dillon: "No, I do not anticipate any significant changes whatsoever in personnel, in organizational structure, or in the way we currently are managing our business.

"The top BOC officials made it very clear to us, as part of the offer, that they did not have in mind any major changes in our overall organization, policies or business strategies. Furthermore, any changes they may suggest in the future will only be implemented with the approval of the Airco Board.

"When our fourth quarter results are published, it will show we've had a very strong finish for 1973. Furthermore, we expect a fine start into 1974. Our improved sales and, particularly, earnings performance indicates that we and our division executives are doing a good job as we are now structured.

"Finally, I think it's important to emphasize that Airco internal management will continue to operate the company for the benefit and best interest of all stockholders, BOC included."

DOES BOC HAVE EFFECTIVE WORKING CONTROL OVER OUR COMPANY?

Mr. Giordano: "Yes, in the sense that acting through its representation on the Airco Board BOC will have a significant voice in policy formulation. We have agreed to give BOC representation on the Airco Board in proportion to its stockholdings. We intend to enlarge our Board to accommodate the required number of directors. Mr. Dillon and I will serve on the BOC Board.

"No, from the standpoint that 65 per cent of the outstanding shares in Airco are still held by the public. The Airco Board and we, as management, must manage the business of Airco for the benefit of all the shareholders without preference or special benefit to any one block of shares.

"Also, BOC has agreed not to increase its stockholdings beyond 4.0 million shares until 1978 -- unless our Board agrees to waive that provision. Also, if for any reason BOC decides to sell its Airco stock at any time in the future, we have first right of refusal. Or, to put it another way, we have the right to buy our stock back if it is offered to anyone else by BOC."

CX-170-C

A4515

IS IT LIKELY THAT AIRCO AND BOC WILL PROCEED TOWARD A CLOSER ASSOCIATION OR AMALGAMATION?

Mr. Dillon: "That remains a possibility, but I want to stress that such a move is a good way off, probably not in the next year.

"There are many very vexing and complex problems to solve first. For example, we don't know how to surmount all of the legal and tax problems that a closer association or a complete amalgamation would present and, of course, approval would have to be obtained from the British Treasury and the Bank of England. Still further, we have to see whether or not we can agree upon basi business strategies. In brief, we've got a good deal of ground to cover befo we know if a complete amalgamation or some other form of closer association makes good sense."

WHAT WOULD BE THE ADVANTAGES OF A CLOSER ASSOCIATION OR COMPLETE AMALGAMATION WITH BOC?

Mr. Dillon: "There are several mutual advantages that could stem from such a move. Combined, we would be the world's largest industrial gas producer; we would better than double Airco's annual sales (to about $1.3 billion) and earnings; we would be a much more broadly based and geographically diversified company; we would be less vulnerable to the cyclical nature of any one industry or nation's economy; we could profit from the ability to market some of BOC's products (which we don't manufacture) in this country -- and market some of our products elsewhere via BOC's marketing groups. Certainly, it would help us to internationalize our business at a much accelerated pace and provide many more overseas opportunities. Also, BOC could help us introduce and sell products it doesn't make, such as various alloys and graphite electrodes."

WHAT EFFECT WILL THE BOC STOCK ACQUISITION HAVE ON THE EMPLOYEE STOCK PURCHASE PLAN?

Mr. Giordano: "None at all. Neither will BOC's ownership affect any of our employee benefits (pensions, retirements, vacations, and so forth)."

WHY DID THE AIRCO STOCK PRICE FALL SO SHARPLY AFTER THE TENDER OFFERS BY C-W AND BOC EXPIRED?

Mr. Dillon: "The stock price drop most likely resulted from a combination of factors. First, the tender offers of $18.00 by C-W and later at $20.00 a share by BOC were well above the stock price of approximately $13.00 a share in early November when the possibility of stock tender offers was first publicized. Following the two offers, the stock rose several points (to as high as 17-1/8 on December 12). Second, it was expected that the stock might suffer a decline following the expiration of the tender offer. As you know, almost 6.2 million shares were properly tendered; therefore, close to 2.2 million shares have to be returned and this "throwback," combined with a depressed stock market, could have had an adverse effect on our stock price."

CX-170-D

A 4516

WILL BOC COMPETE WITH AIRCO IN THE U.S.?

Mr. Giordano: "BOC has not competed with Airco in the past in any significant way. Less than one per cent of BOC's sales last year were made in the United States, and almost all of BOC's businesses outside of the United Kingdom are British Commonwealth countries where, for many decades, BOC enjoyed an advantage over noncommonwealth countries.

"BOC's ownership of 4 million shares of Airco stock will in no way restrict Airco's or BOC's ability to compete anywhere in the world. With the closer association between the companies, it might be that we will market some of BOC's products via our existing marketing groups and BOC likewise might assist in marketing our products in its major product areas. The most fruitful cooperation most likely will be in those countries where currently neither of us is a major supplier."

IS THERE ANY POSSIBILITY THAT THE FEDERAL TRADE COMMISSION WILL BLOCK BOC'S ACQUISITION OF AIRCO SHARES?

Mr. Giordano: "The FTC investigated, but did not seek to enjoin BOC's acquisition of 4 million Airco shares. However, the FTC may continue its investigation to decide whether it should challenge BOC's ownership of Airco shares on anti-trust grounds. BOC and Airco do not believe that such a challenge would be successful."

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BOC REPORTS SHARP INCREASE IN LAST YEAR'S EARNINGS AND SALES

LONDON, Dec. 20 -- BOC said net for year ended September 30 was $28,787,000 versus $25,750,000 a year ago. Sales were $737,100,000 versus $583,500,000 the previous year. BOC also declared a final dividend of 3.2 cents a share net, making a total of 5.1 cents for the full year. This is the maximum dividend permitted for the year under Government regulations and represents a five per cent increase over last year's payment.

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NOTE: The above figures are based on rate of exchange of $2.31 per pound as of December 20. BOC's current price on the London Stock Exchange is $1.02 (44 pence).

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Your comments and questions are welcomed. Send to THE EDITOR, MANAGEMENT NEWSLETTER, Communications Dept., Airco, Inc., 85 Chestnut Ridge Road, Montvale, New Jersey 07645.

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AVCO

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Telephone: (212) MUrray Hill 2-8700

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AIRCO STOCKHOLDER CLASSIFICATIONS

Common Stock as of December 31, 1957

CLASS	STOCK-HOLDERS	PER CENT	SHARES HELD	PER CENT
Men	15,740	38.9	2,350,591	21.2
Women	12,691	31.4	1,652,293	14.9
Joint Accounts	6,679	16.5	660,407	6.0
Fiduciaries and Institutions	3,136	7.8	747,469	6.7
Brokers and Security Dealers	291	0.7	1,127,533	10.2
Canadian and Foreign	258	0.6	136,133	1.2
Nominees, Mutual Funds and Others	1,650	4.1	4,417,368	39.8
Totals	40,445	100.0	11,091,804	100.0

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1967 HIGHLIGHTS With Comparative Figures for 1966

	1967	1966	Change
Sales	$413,083,000	$430,409,000	— 4.0%
Depreciation	21,059,000	19,604,000	+ 7.4%
Income Before Taxes	40,747,000	48,762,000	— 16.4%
Federal and Foreign Taxes	16,032,000	19,455,000	— 17.6%
Income Before Extraordinary Charge	24,715,000	29,307,000	— 15.7%
Earnings Per Share Before Extraordinary Charge*	2.28	2.77	— 17.7%
Dividends Paid Per Share*	1.50	1.25	+ 20.0%
Book Value Per Share*	21.88	21.45	+ 2.0%
Facility Additions			
Capital Expenditures	42,600,000	32,900,000	+ 29.5%
Leased Facilities	26,700,000	8,800,000	+203.4%
Total Assets (less applicable reserves)	467,199,000	446,561,000	+ 4.6%
Shares of Common Stock at End of Year*	11,091,804	10,619,568	+ 4.4%
Number of Stockholders at End of Year	40,445	36,334	+ 11.3%
Number of Employees at End of Year	13,644	14,375	— 5.1%

*Adjusted for 2-for-1 stock split April 26, 1967

Annual Meeting—April 24, 1968—moves to larger room

Airco stockholders are cordially invited to attend the 1968 Annual Meeting at 10 A.M. on Wednesday, April 24, 1968. The meeting will be held in a larger and more convenient room this year—the *Windsor Suite* on the lobby floor of the Hotel Commodore, 109 East 42nd Street, New York City. Formal notices of the Annual Meeting, Proxies and Proxy Statements will be mailed on or about March 26, 1968.

BEST COPY AVAILABLE

TO OUR 40,000 STOCKHOLDERS:

March 6, 1968

During 1967, your company's fifty-second year, our performance in sales and in earnings was disappointing.

The decline in the production of industrial durable goods throughout most of the year adversely affected our welding products, graphite, and polyvinyl chloride businesses. Profitability in our electronics business also was affected adversely by radio and television set sales, which were well below industry predictions, and by intense price competition from foreign competitors.

In spite of the soft economy, several of our divisions turned in excellent performances. Our medical products and carbide acetylene businesses showed significant advances in sales and profits. Our alloys and overall industrial gas operations also maintained 1966 profit levels despite lower sales.

SALES AND EARNINGS COMPARISONS

Our sales in 1967 were $413.1 million, 4 per cent below sales in 1966 of $430.4 million. Our net earnings from operations in 1967 were $24.7 million, 15.7 per cent below earnings of $29.3 million in 1966. Net earnings per share from operations were $2.28 in 1967, compared with earnings of $2.77 in 1966.

The Board of Directors established a reserve, to cover the write-off of obsolete facilities, that resulted in an extraordinary charge to 1967 net earnings of $12 million, or $1.11 per share. Net earnings after the extraordinary charge were $12,715,000, or $1.17 per share. This reserve, established primarily for industrial gas and chemical facilities, is explained in more detail under Facility Additions in the Financial Section, page 25.

DIVIDENDS INCREASED 20 PER CENT

Regular quarterly dividends of 37½ cents per share (adjusted for the stock split approved by the stockholders in April) were paid by the company on its common stock in 1967, a 20 per cent increase over the amount paid in 1966. The dividend paid on March 5, 1968, was the 203rd consecutive regular quarterly dividend paid by the company on its common stock. Airco's record of consecutive quarterly dividend payments now extends over a period of more than 50 years.

BANK FINANCING

In August, the company entered into a bank loan agreement, which revised the terms of an original agreement made with 14 banks in September, 1966. The revised agreement provides a line of credit up to $52.5 million during the period ending December 31, 1969. The amount owed by the company on that date is repayable in two equal annual payments on December 31, 1970 and 1971. To date, the company has borrowed a total of $28.9 million under the agreement.

NEW DIRECTORS AND OFFICERS

Two new directors were added to the Board of Directors in 1967. Crocker Nevin, 44, President of Marine Midland Grace Trust Company of New York, was elected a director in April, and Hugh R. Smith, Jr., 47, President of the Airco Temescal Division, was elected a director in August.

In April, Donald Reich, 46, formerly Vice President and Secretary, was elected Vice President-Administration of the company; and Joseph M. Walsh, Jr., 35, formerly Assistant Secretary, was elected Secretary of the company. In December, Norris B. McFarlane, 55, formerly President of the Airco Alloys Division, was elected a Group Vice President of the company.

MAJOR CORPORATE AND DIVISIONAL ORGANIZATIONAL CHANGES

Shortly after the beginning of 1968, Gordon J. Arquette, 42, was appointed Director of Science and Engineering for the corporation. Prior to this appointment, Dr. Arquette had been Director of Research.

We also reorganized and considerably strengthened our company's long-range planning, new product development and acquisition programs, and in October, 1967, named David J. Craig, 42, to head up these areas as Director, Corporate Planning and Development.

During 1967 and the first month of 1968 we reorganized and consolidated five divisions into two divisions, as follows:

The Airco Pacific Division was merged in August, 1967, into two other divisions—Airco Industrial Gases and Airco Welding Products.

The National Carbide Division was merged with the Airco Alloys Division in December, 1967, and the consolidated areas are now the Airco Alloys and Carbide Division. Donald E. Stingel, 48, formerly President of the National Carbide Division, was appointed President of the newly consolidated division.

The Airco Distributor Products Division was merged with the Airco Welding Products Division and the unified activity is now the Airco Welding Products Division. Lawrence W. Kunkler, 40, formerly Vice President-Marketing for the AWP Division, was named President of this major Airco division.

In addition to the above consolidations, we also phased out the Newark, New Jersey, plant of the Airco Cryogenics Division at year-end, and transferred the East Coast operations and activities to the division's new cryogenics equipment plant in Irvine, California. At the same time, Paul P. Duron, 43, formerly Executive Vice President of the Airco Cryogenics Division was named President.

GROWTH THROUGH ACQUISITIONS AND JOINT VENTURES

We made three acquisitions in 1967. The largest of these was Temescal Metallurgical Corporation, which was acquired and became the Airco Temescal Division in June 1967.

In August, Airco acquired one of Canada's leading resistor manufacturing companies, Precision Electronic Components Limited, which now operates as part of the Airco Speer Division.

Early in the fourth quarter, Airco acquired Galleher, Inc., as well as its manufacturing organization, Elastomers, Inc., which makes conductive rubber products, and merged it into the Ohio Medical Products Division.

Airco announced in December, 1967, its intent to acquire the Maust Coal and Coke Corp. in exchange for Airco common and convertible preferred stock, worth approximately $18.5 million. This acquisition is expected to be completed before the end of the first quarter of 1968.

A major joint venture was formed in October, 1967, with the British Oxygen Company. This joint venture is a worldwide operation, which designs, constructs and markets cryogenic plants and other low temperature process equipment.

Additional information on acquisitions and joint ventures is provided in the appropriate divisional reviews and the Financial Section of this report.

Once again, we want to extend our sincere appreciation to our 13,600 employees, to our distributors and customers, and to our 40,000 stockholders for their interest and support.

George S. Dillon

GEORGE S. DILLON
President

John A. Hill

JOHN A. HILL
Chairman

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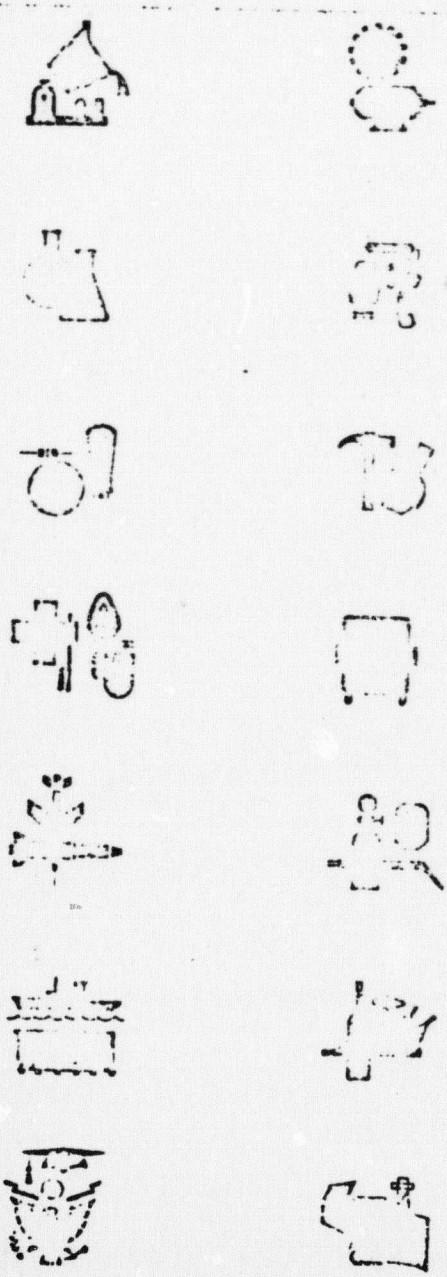
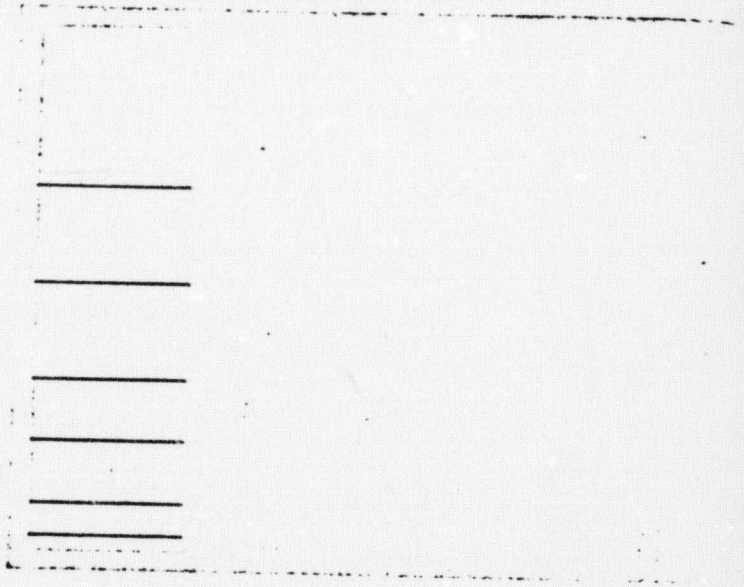
A 4522

WHERE THE SALES DOLLAR CAME FROM

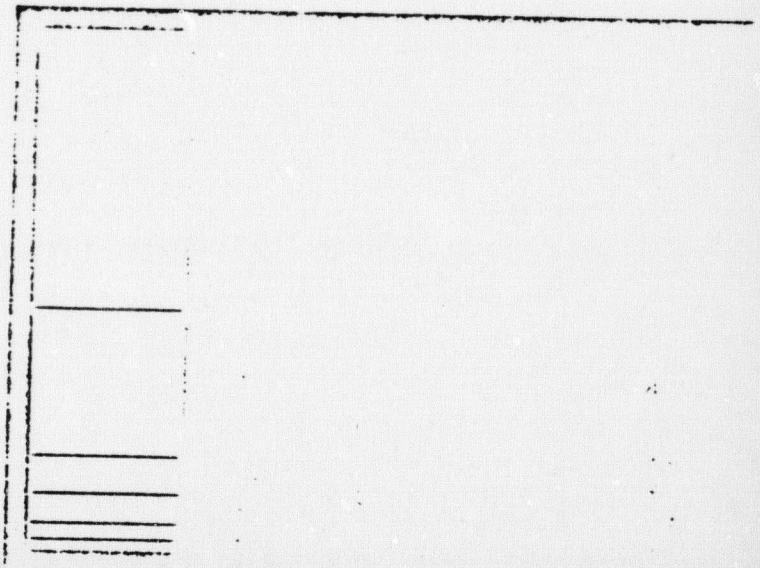
SALES TO INDUSTRIES



SALES BY MAJOR PRODUCT LINES



WHERE THE SALES DOLLAR WENT



AIRCO INDUSTRIAL GASES DIVISION

A 4523

Profits Held Firm in Spite of Industry Sales Decline. Major Plant Started Up At Year-End.

Although industrial gas sales in 1967 were lower than the previous year for the entire industry, the Airco Industrial Gases Division maintained its earnings at approximately the same level as in 1966. This profit performance, in a year when sales were well below trend, is the result of having two large, low-cost air separation plants in full production, and also reflects the success of the liquid helium distribution system.

Organization changes — In mid-1967, the gases segment of the Airco Pacific Division was merged into the Airco Industrial Gases Division. This consolidation established a more effective, nationwide production and marketing effort.

Last October, Airco and the British Oxygen Company formed a 50-50 joint venture to design, construct and market, throughout the world, air separation plants and other low temperature process equipment. The Airco Industrial Gases Division's Engineering and Development Department formed the nucleus of the joint venture's operations in the United States.

Two new plants completed — Two new tonnage gas plants were constructed during the past year. In the second quarter of 1967, Airco started up a 200-ton-a-day high purity gaseous oxygen facility to supply the open hearth furnaces of Bethlehem Steel's plant at Johnstown, Pennsylvania. Airco also operates a 675-ton-a-day oxygen plant at this location, serving this same customer.

In December 1967, at the Arroyo site near Chester, West Virginia, Airco began production at its new 2,500-ton-a-day air separation plant, one of the largest and most modern facilities in the world. This facility will supply oxygen, via a 28-mile pipeline, to the new basic oxygen furnaces nearing completion at the Jones & Laughlin Steel Corporation's works in Aliquippa, Pennsylvania. Liquid and gaseous oxygen, nitrogen and argon also will be marketed to other industries in the area.

Another large Airco air separation plant, slated for completion during the third quarter of 1968, is under construction at Bethlehem, Pennsylvania. This 1,200-ton-a-day facility will supply high purity gaseous oxygen to the Bethlehem Steel Corporation's new basic oxygen furnaces. In addition, the new plant will supply merchant markets throughout the region with liquid and gaseous oxygen, nitrogen and argon.

AIRCO CRYOGENICS DIVISION

Equipment sales reached new highs.
Modern West Coast Plant Completed.

Sales of the Airco Cryogenics Division reached record levels as the demand steadily increased for the division's highly respected line of pumps, vaporizers, storage and transport tankage, and special systems. Sophisticated cryogenic machinery of this type is required more and more by producers, distributors and users of cryogenic fluids (liquefied industrial gases).

New plant completed — Early last year, Airco Cryogenics completed a new and ultramodern 55,000-square-foot cryogenic equipment manufacturing plant at Irvine, California, near Los Angeles. With the phasing-out, at year-end, of the division's other facility at Newark, New Jersey, because it was an uneconomical operation, all cryogenic equipment manufacturing is now consolidated at the Irvine installation.

New product line added — Last year, a revolutionary type of cryogenic refrigerator, incorporating a unique turbo-expander design, was developed by a special advanced engineering group at Airco's Central Research Laboratories. Known as the °Kryosystems line, the new products have been turned over to the Airco Cryogenics Division for production and marketing. These units are highly efficient and compact liquefier/refrigerators for ultracold liquid helium (*minus* 452°F.), which is used by research organizations.

AIRCO WELDING PRODUCTS DIVISION

A 4524

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Sales and Earnings Off, Reflecting Downtrend in Metal Fabricating. Distributor and Welding Products Divisions Consolidated for Greater Effectiveness. Major Wire Plant Opened.

During 1967, the Airco Welding Products Division felt the impact of a soft economy, with sales and earnings well below the record levels of 1966. The welding and cutting equipment business was affected adversely by industry cutbacks in capital expenditures and by a general decline in the metal fabricating business.

The division's products include a wide variety of capital goods, ranging from a small farm welder, priced at $100. up to giant numerical tape-controlled cutting machines, priced as high as $300,000. Contributing factors which penalized 1967 earnings were the non-recurring costs of installing a computer system for production scheduling and inventory control at the equipment manufacturing plant in Union, New Jersey, and start-up costs at the new Arroyo welding wire plant.

New Arroyo wire plant operational—During the last quarter of 1967, production operations were started at the new welding wire plant located near Chester, West Virginia. The Arroyo plant manufactures consumable welding wires—the solid and flux-cored wires used with the inert gas-shielded arc welding process. The trend from welding with stick electrodes to gas-shielded arc welding with continuously-fed wire is still in full swing. The market growth for consumable solid and flux-cored wire is estimated at 18 to 20 per cent per year. The production scale and low costs provided by the new wire plant will place Airco in a strong competitive position to capitalize on this growing market. The division also produces arc welding filler metals at Sparrows Point, Maryland, and Cleveland, Ohio.

Organization changes—In early 1968, the company consolidated its Distributor Products and Welding Products divisions into one enlarged division called the Airco Welding Products Division. The merger will provide a marked improvement in responsiveness to distributor problems and opportunities, and result in more unified and effective marketing policies.

Large cutting machines—Airco continued its penetration into the growing market for large, automated flame cutting machines with two major installations during 1967. General Dynamics' Quincy, Massachusetts, shipyard placed in operation an Airco TAPE-O-GRAPH and an Airco PATIO-GRAPH at a total cost of about $400.000. Joseph T. Ryerson & Son, Inc., a Chicago steel service center, installed the world's largest flame cutting machine, an Airco TAPE-O-GRAPH worth more than $300.000. Airco advanced technology in automated cutting equipment offers metal fabricators cost savings and precision end-products that fully justify the huge capital investment required.

Distributor training—The division continued its intensive program of distributor training, initiated in 1966, with a series of comprehensive courses for distributor salesmen at Airco Training Centers in King of Prussia, Pennsylvania, and Broadview, Illinois. Subjects range from basic product information and fundamental welding process theory to advanced in-depth studies, demonstrations and actual practice with Airco processes and equipment. The courses provide Airco distributor salesmen with a thorough, practical knowledge of markets and selling techniques. The division also plans to conduct special customer training classes during 1968.

Welding supplies and accessories—Jackson Products, a department of the Airco Welding Products Division, more than doubled its production capacity with the completion in 1967 of new facilities at its Toronto, Ontario, manufacturing plant. Jackson's main manufacturing plant and headquarters are at Warren, Michigan. The product line includes electrode holders, cable connectors and a variety of safety equipment such as safety glasses, caps and welding helmets. The department's sales are conducted on a worldwide basis through more than 3,500 U.S. and foreign distributors. Jackson's sales fought the downward trend and held steady during 1967.

OHIO MEDICAL PRODUCTS DIVISION

A 4525

Record Sales and Earnings Attained. Several Promising New Medical Products Introduced. Acquired Maker of Quality Rubber Products for Hospital Equipment.

In 1967, sales and earnings of the Ohio Medical Products Division set all-time records, with continued good progress in the sales of medical equipment for hospitals and home use. Medical gas sales were up moderately.

The demand for new and improved products in the medical field is at a very high level for several major reasons: the need for advanced equipment to meet the rapidly changing developments in medical techniques for better patient care; the rising personnel costs in hospitals; and the pressures of substantially increasing numbers of patients while the shortage of doctors and trained medical personnel continues.

The new products from Ohio Medical are designed to assist in relieving these problems, and the division is maintaining a swift pace for the introduction of new equipment. Nearly 80 per cent of Ohio Medical's equipment products were placed on the market since 1960.

Significant respiratory treatment device—The HAND-E-VENT, a unique *intermittent positive pressure breathing* (IPPB) unit for treating emphysema, bronchitis and other chronic respiratory diseases was introduced during the year. It proved to be a great success, with immediate acceptance by both physicians and patients.

Ohio Medical's HAND-E-VENT sells for less than a third of the amount of conventional units, and patients may be taught to operate the individually-assigned, hand-held unit within minutes. Hospital personnel, as a result, are quickly freed for other duties, and patients also may continue individual therapy at home.

Other major new products—The division's new Controlled Environment Tent permits the therapist to administer either oxygen *or* cool, clean, filtered air for varying types of conditions such as post-operative, infectious or allergic cases. In essence, the patient can be isolated from his environment and the surrounding area may be protected from the infectious patient.

In collaboration with the Mayo Clinic, Ohio Medical developed a new product system for more accurate measurement of inhalation anesthetics. The Mayo Vapor Analyzer verifies anesthetic concentrations, evaluates vaporization apparatus and allows sequential monitoring of anesthetic systems. By using the Analyzer, the anesthesiologist is able to improve his technique and provide for the greater safety of the patient.

With its Thomas CRYOPTOR precision cryosurgery system for cataract extractions, the division entered a new medical equipment field, which combines the advances in cryogenics and surgical techniques. After the lens is freed surgically, the CRYOPTOR probe adheres firmly to the cataract by freezing, allowing safe removal.

Manufacturer of rubber parts acquired—Airco acquired in October the assets and business of Galleher, Inc., and its manufacturing arm, Elastomers, Inc., located in Fort Myers, Florida. The operations were merged into Ohio Medical Products, which has been the exclusive outlet for Galleher's products since 1950.

The Elastomers plant is the world's largest producer of *fully conductive* natural rubber latex parts—such as face masks, inhaler tubing and breathing bags—for anesthesia equipment. Conductive and non-conductive rubber parts made at the Fort Myers facility are used also for inhalation therapy and resuscitation equipment.

Division receives government award—A "Value Engineering Award" was presented to Ohio Medical by the U.S. Department of Defense for outstanding cost reduction of the division's compact Model 785 Field Anesthesia Machine manufactured specifically for military use in administering inhalation anesthetics during field surgery.

Canadian operations—Ohio Medical Products Canada is the new name of the division of Air Reduction Canada Limited which markets hospital equipment and medical gases. Sales in Canada were also at record levels in 1967.

A 4526

Alloys and Carbide Activities Combined to Form Airco's Largest Division. Major Cost-Saving Processes Introduced.

In December, National Carbide was merged with Airco Alloys to form the Airco Alloys and Carbide Division, with headquarters at Niagara Falls, New York. The new division, which is Airco's largest in terms of sales and earnings, is also the second largest producer of ferroalloys and the largest producer of calcium carbide in the United States.

Ferroalloys profits rise slightly—The decline in steel production in 1967 had obvious adverse repercussions in ferroalloy sales, yet the division gained on its competition and increased its share of the market. Moreover, due to its modern production facilities and a new casting process, profits from the division's ferroalloy business were slightly higher.

New casting process—Early in 1967, a new technique for producing and casting higher quality ferroalloys at lower cost was introduced after an intensive development program. With the new process being used at all of its plants, the division has been pouring up to 150 tons of ferroalloys in one cast instead of the former four-ton casts. Ferroalloys, such as ferrosilicon, ferrochrome and ferromanganese, produced by using the new casting method are tougher, cleaner, denser, more uniform in size and do not deteriorate from aging or handling.

New ferroalloys facilities—The new casting approach has revolutionized the division's production operations. New, large electric furnace installations at Charleston, South Carolina, and Calvert City, Kentucky, will incorporate this technique. These units are expected to be in operation in 1969. The increased production at Charleston will serve international markets as well as domestic, because the plant is located on tidewater and is not burdened by costly inland freight charges.

Acetylene and lime show improved profits—The division reported considerable improvement in sales and earnings from carbide acetylene operations as well as from sales of dry lime hydrate. As a result of the division's outstanding cost reduction efforts, acetylene produced by the carbide route is aggressively meeting competitive threats from other sources of acetylene.

For many years, wet generator lime residue has been accumulated in large piles at the division's acetylene generating plants, adding to costs and occupying valuable land for storage. However, with the new facilities producing *dry* lime hydrate, which is lighter and both easier and cheaper to ship, the division is not only selling all it can produce, but is also drying out and utilizing the millions of tons of wet lime sludge inventory carried on the books at no value.

Thousands of tons of Airco dry lime hydrate are being used as a binder to stabilize road beds throughout the South. Other major applications include the reduction of stream pollution through the treatment of coal mine drainage, and industrial acid and waste neutralization.

New carbide furnace planned—A large, covered electric furnace for the production of calcium carbide will be constructed at Louisville, Kentucky, during 1968 and is expected to be operational during the first quarter of 1969. The new furnace, specifically designed and engineered to greatly curtail air pollutants, will replace the majority of the small open furnaces now in use.

As a result of the plant improvements at Calvert City and Louisville, the smaller, less efficient carbide plants at Keokuk, Iowa, and Ivanhoe, Virginia, were closed during 1967.

Coal mining acquisition planned—If, as anticipated, the acquisition of the Maust Coal and Coke Corp. is completed in the first quarter of 1968, it will become a wholly-owned subsidiary reporting through the Airco Alloys and Carbide Division. Airco's interest in the coal business stems from the industry's promising growth opportunities and the company's large requirements for metallurgical coke in ferroalloy and carbide operations.

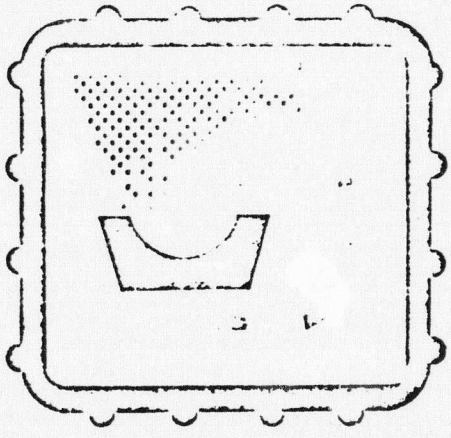
AIRCO TEMESCAL DIVISION

A 4527

Acquisition Increased Sales and Earnings. Division's Sophisticated High-Vacuum and Electron-Beam Equipment in Strong Demand.

Temescal Metallurgical Corporation, with a plant in Berkeley, California, was acquired on June 1, 1967, and became the Airco Temescal Division. A leader in the field of high-vacuum electron-beam processing systems and equipment for basic industry, Airco Temescal improved its sales and earnings over 1966.

Some definitions—Since the division is new to Airco and operates in highly technical fields, it might be helpful to define a few basic terms. *High-vacuum* is an atmosphere or environment with less than one-ten millionth the number of gas particles in normal atmosphere. An *electron-beam* is a focused beam of high energy electrons projected onto materials causing them to melt and/or evaporate. Electron-beam heating is used in coating optical or plate glass, metals, plastics and even paper; it is used in depositing electronic circuits onto various materials, such as glass, ceramics and metals; and it is used in the refining of molten materials, such as refractory metals and stainless steels. Airco Temescal was a pioneer in developing *deflected* electron-beams, bent as much as 270° from the filament sources to "hide" or protect them from vapors emanating from the heated target (see sketch).



Electron-beam being deflected 270° to target in a high-vacuum environment.

Major products at forefront of technology—Airco Temescal has moved high-vacuum electron-beam processing from the laboratory experiments of a few decades ago to immense installations for today's factory production lines. In addition to manufacturing electron-beam "guns" or energy sources, the division makes complete processing systems incorporating electron-beam and other types of heating techniques. Other products include power supplies, magnets, transformers and control centers. Its high-vacuum equipment includes valves, instrumentation and pumping systems. Temescal processing systems include electron-beam and induction melting and casting furnaces; evaporation or coating units; and continuous strip annealing and coating systems.

Vacuum furnace installations—Three electron-beam melting and casting furnaces, designed and constructed by Airco Temescal, were installed at the Materials Systems Division of Union Carbide, Kokomo, Indiana. The furnaces, for refractory metal production, were of 100, 300 and 600 KW rating. Temescal also designed and built the vacuum melting system for a 15-ton capacity, 4200 KW induction furnace at the New Hartford, New York, Special Metals Corporation, a subsidiary of Allegheny Ludlum Steel Corporation.

New production techniques—With the division's Fast-Cycle Coater, the concept of automated, high through-put coating systems for microcircuit applications was proved, and major systems were delivered to the electronics industry during 1967. The development of techniques for coating metal parts with complex alloys resulted in a family of superior, corrosion-resistant coatings for jet engine vanes and blades which will have much increased performance life. Large titanium sublimation pumping systems, designed and tested during the year, offer industry a new, lower-cost method of high-vacuum pumping. Development work was done in cooperation with major steel companies on vacuum coating of flat rolled steel.

A 4528

CX-122-L

Sales Declined from Record Levels.
Division Reorganized and Name Changed.
Graphite Facility Expansions Continue.

Overall division performance—In 1967, sales by the Airco Speer Division declined from record 1966 sales, but were higher than any previous year. The majority of carbon, graphite and electronic component product lines faced a reduced market demand because of the generally slow economy throughout the year. However, some Airco Speer products, notably large electrodes, graphite rocket nozzles, low wattage resistors and radio frequency choke coils, did post modest gains over 1966 sales levels.

The division's diversified business was consolidated during September into two new operating groups that embrace the major product areas of *graphite* and *electronics*. The transition from a departmental organization to a divisional organization with separate profit centers was accomplished with minimum shifting of personnel and reporting changes. The *graphite group* encompasses the activities of the carbon products plants at St. Marys and Punxsutawney, Pennsylvania, and Montreal, Quebec; and the electrodes and anodes plants at St. Marys, and at Niagara Falls, New York. The *electronics group* includes all activities of the electronic components plants at Bradford and DuBois, Pennsylvania.

These changes were made to strengthen the division's management team and organizational structure, and for more unified programs to accelerate Airco Speer's growth rate.

Following the above reorganization, the division's name was changed from Speer Carbon to Airco Speer as a further step in obtaining the full benefits of the unified company image created through the Corporate Identity Program.

Market growth and facility expansions—The general trend of demand for graphite electrodes and anodes is expected to be stronger in the future despite some fluctuations of consumption.

The division's consumable graphite electrodes, weighing as much as 2,400 pounds, are used in electric arc furnaces for the production of steel. Millions of pounds of Airco Speer graphite anodes are used annually by the chemical industry in the electrolytic production of chlorine, caustic soda, sodium and magnesium.

During the year, various stages of the graphite capacity expansion program at Niagara Falls and St. Marys were completed and phased into operation. At St. Marys, new facilities were completed for pitch impregnating, storage and graphitizing. Additional new buildings were constructed to house mechanized equipment for surface cleaning of large, baked carbon pieces. Large silos and conveying equipment were installed to store and move raw materials for the graphitizing operation. A new service building for housing the electrical controls for the graphitizing transformers was put into service. And in March 1968, a new building for machine finishing and shipping large electrodes and anodes was completed. In February 1968, ground was broken at St. Marys for the building and furnaces to be used for baking large carbon items, and completion is scheduled for mid-1969.

With new facilities for mixing, milling and extruding, and expanded facilities for baking and graphitizing being completed at Niagara Falls, Airco Speer will soon have two completely integrated graphite plants, neither of which was capable of performing all operations in the past. This will result in more economical and efficient production at both locations, and will furnish added competitive capabilities.

New quality control methods and facilities were installed also and will assist the division in maintaining favorable quality levels in the highly competitive graphite markets.

Speer Canada increases gains—Speer Carbon Company of Canada Limited, a wholly-owned subsidiary, set all-time sales records in 1967. This Canadian operation produces carbon brushes, for motors and generators, and a wide variety of carbon and graphite specialty products.

A 4529

New Production Control Systems Installed.
Canadian Manufacturer Acquired.
Electronic Product Line Broadened.

The Airco Speer Division's electronic components business was affected adversely in 1967 by substantially lower-than-predicted radio and television set production. Such production has a direct effect on Airco Speer's sales, since this market is a major customer for components made by the division. Also playing a part in lower sales levels was the intense price competition from abroad for the larger volume fixed composition resistors used in consumer products. Programs are well under way to combat such competition with more efficient production methods, which will reduce manufacturing costs. These programs, plus more aggressive marketing techniques, are expected to improve the division's position as a large volume supplier of electronic components.

Computerized production controls operational—Airco Speer's electronic components plant at Bradford, Pennsylvania, was equipped with a new computerized production and inventory control system during the last quarter of 1967. The system gives the plant management almost instantaneous information as to the identification, quantity, location and movement of material, inventory and customer orders throughout the plant.

Coupled with the computerized in-process control and testing system in use at this plant for three years, the new computer system enables the division to respond, within minutes, to critical delivery requirements or problem situations, and assure the prompt shipment of quality resistors. Without the system, precious minutes or hours could be lost in pinpointing trouble spots or in checking the status of particular orders among the thousands being processed.

Production of capacitors at the division's plant in DuBois, Pennsylvania, has also benefitted from the installation of advanced equipment. New automated sorting and testing devices have shortened the production cycle at the plant, while improving quality control.

Sales of radio frequency choke coils, a major product line of the DuBois plant, were improved over the preceding year due primarily to increased applications in industrial and military electronic equipment.

New product line introduced—Cost and miniaturization needs in the electronic industry have prompted the development of electronic circuit designs using thick or thin films to form the resistive and conductive network on small ceramic substrates. Since thick film technology offers the most versatility, Airco Speer has developed and introduced a new line of less expensive thick film cermet pastes. It is sold to customers, who will apply the material in patterns on ceramic substrates to produce their own miniature resistor and conductor networks.

Thick film networks have numerous applications in automotive and home appliance circuitry, computers, home entertainment electronic items, and industrial and military electronic equipment. The division holds patents covering the use of these thallium oxide-glass compositions to produce thick film resistive elements.

Canadian acquisition—Precision Electronic Components Limited of Toronto, Ontario, a highly regarded Canadian manufacturer of components, which are different from but complementary to the Airco Speer line, was acquired in August 1967. This wholly-owned subsidiary, founded 18 years ago, has built up a reputation in harmony with that of Airco Speer for the high quality and reliability of its products, consisting of low power, semi-precision variable resistors and trimmer potentiometers. The Canadian subsidiary's products are used in the manufacture of industrial and military electronic apparatus, such as transmitting equipment, computers, electronic test instruments and two-way communications equipment.

Precision Electronic Components markets its products in both Canada and the United States through its own sales organization.

A 4530

Chemical and Plastic Sales Were Down, but Division's Performance Improved. Product Development Success and New Facilities Support Promising Outlook.

The Airco Chemicals and Plastics Division showed modest improvement over 1966 in its performance, and the division is continuing its high level of expenditures on research and development to achieve better results in future years. Some examples of products resulting from research are the AIRCOFLEX® emulsions and AIRCO 400 SERIES propylene-modified polyvinyl chloride (PVC) resins.

Markets grow for Aircoflex emulsions—AIRCOFLEX vinyl acetate-ethylene copolymer emulsions continue to win ready acceptance in paper, paint, and adhesive markets due to their high versatility and end-use advantages. New markets are being developed for each of the four types of AIRCOFLEX emulsions now produced by Airco.

AIRCOFLEX 100 HS, for the coating of paper and paperboard, offers good binding properties for pigmented paper and paperboard coatings, and AIRCOFLEX 500 and 510 paint vehicles offer good leveling and hiding with low-temperature coalescence (film fusion of the paint is good even when drying at low temperatures).

AIRCOFLEX 400, an adhesive base placed on the market in early 1967, has excellent adhesion to such hard-to-adhere materials as PVC, cellulose acetate, polystyrene, foil, and galvanized iron. This versatility has opened new markets, ranging from carton sealing to bonding high-fidelity speaker assemblies.

Other emulsion products—The division produces a wide range of FLEXBOND® copolymer emulsions, which have maintained an upward trend in sales to the paint and adhesives industries. Another important group of emulsions is the VINAC® vinyl acetate homopolymer series. VINAC emulsions are a mainstay for high speed packaging adhesives. They are used also as paper coating binders, and as finishing resins in the textile industry.

Polyvinyl alcohol capacity increased—Due to the demand created for VINOL polyvinyl alcohol (PVA) in such markets as textile sizing and paper coating, the division's PVA plant at Calvert City, Kentucky, has been expanded substantially to form one of the largest facilities of its type in the nation. Competition was felt during the year from imported product, but Airco's modern, large-scale facilities and basic raw material position will be fully capable of regaining the division's position in the future.

Development work in other PVA specialty areas, such as multilaminate film and vacuum-flush pouch packaging, is also being conducted to find new markets based on the exceptional barrier characteristics of packaging film made from this material. Longer storage life for foods packaged in PVA film and film laminates is expected to provide an appreciable share of the growing food packaging market.

[illegible] problems—A slackness in Airco's markets for polyvinyl chloride (PVC) resulted in lower earnings for this segment of the division in 1967.

To offset this situation, a long-range program of specialty product development, initiated two years ago with the introduction of AIRCO 400 SERIES copolymer PVC resins, should contribute to the profitability of the PVC area during 1968. These versatile and unique propylene-modified polyvinyl chloride resins, developed in Airco's Central Research Laboratories, at Murray Hill, New Jersey, have better processability than conventional homopolymer PVC.

Airco 400 series PVC for food packaging—In May, 1967, the Food and Drug Administration cleared the AIRCO 400 SERIES resins for use in packaging all types of foods. These resins are now being aggressively promoted to the $3.5 billion food packaging industry. Food packers and processors are being informed of the advantages of merchandising their products in film and sheet as well as in shatterproof, glass-clear containers and bottles made from AIRCO 400 SERIES PVC compounds. For example, processing advantages of AIRCO 400 SERIES enable production rates high

EX-172-O

enough to meet the volume demands of the food packaging industry.

Other markets for Airco 400 Series — Nonfood markets for AIRCO 400 SERIES PVC are expected to add significantly to the profit potential of Airco's specialty product development programs. Processing advantages contribute to wide application in markets such as industrial profile extrusion, injection molding, pipe and pipe fittings and appliance parts. Due to the inherently self-extinguishing characteristics of the material, major use is seen in parts for expensive electronic hardware such as computers.

New vinyl fabrics introduced — In October, two new expanded vinyl fabrics were introduced by Airco Chemicals and Plastics at the High Point, North Carolina, Home Furnishings Mart. Called "Rembrant" and "Van Gogh", these highly styled, decorator vinyl fabrics have already gained sales momentum in both contract and home furnishings markets. One of the largest contract installations to date of Airco vinyls was completed in early 1968, using Rembrant fabric at the new Holiday Inn in Redding, California.

Production of expanded vinyl fabrics has been transferred from the Belleville, New Jersey, plant to new facilities at Parsippany, New Jersey, as part of Airco's program for the modernization of its automotive and nonautomotive vinyl fabric operations. Significant manufacturing economies and more flexible production schedules resulting from this move, will improve substantially the profitability from sales of expanded vinyl fabrics to furniture upholstery, luggage, footwear, and marine markets.

Automotive fabrics in full production — The division's Sandusky, Ohio, calendering plant for vinyl fabrics went into full production during 1967, resulting in better quality and service being offered to the automotive industry. Due to start-up problems encountered with the highly automated Sandusky plant in 1966, sales volume during early 1967 was restricted. In addition, failure of the automotive industry to achieve a full production year for 1967 model cars limited the potential of this market.

With full production and top quality achieved in the Sandusky operation during 1967, increased sales with a greater percentage of higher margin fabrics for 1969 model cars are expected. Profitability in this area should also be assisted by a better year in automobile production.

Custom molding of consumer products — Use of AIRCO 400 SERIES PVC resins for custom molding of appliance housings and parts, anesthesia machine components, and complex and difficult-to-mold industrial profiles is another example of close cooperation within the division, resulting in significant competitive advantages. The improved processability of AIRCO 400 SERIES PVC enables the division's plants to produce difficult-to-form parts for a wide variety of consumer and industrial applications. For example, plastics are now being used in structural and molded parts of furniture.

DUCTALL industrial hoses, produced at Costa Mesa, California, as well as at Morristown, New Jersey, are being used for the movement of air, gases, dust, liquids and other materials. Sales of these products increased during 1967.

In the consumer area, sales of DUCTALL swimming pool vacuum cleaning hoses and accessories continue to improve. E-Z Drain DUCTALL compressible hose for travel trailers has scored wide success since its introduction in 1967, with over 100,000 units in use on the West Coast alone.

In addition to marketing these products, the already extensive molded plastics line is being diversified and restyled, and custom molding contracts are being aggressively pursued in all sectors of industry. The division's expertise in molding technology, plus the added design capability gained through use of AIRCO 400 SERIES, should result in higher sales volume and earnings for this segment of operations during 1968.

Airco Employees Upgraded Skills.
Minority Group Recruiting Increased.
Safety Performance Improved.

At the end of 1967, there were 13,644 Airco people employed in the United States and Canada. This represents a decrease of 5.1 per cent, compared with 14,375 employees in 1966.

Equal opportunity employer—During 1967, Airco intensified its programs designed to seek and employ minority group applicants. Significant progress was made in recruiting at predominantly Negro colleges and universities through numerous campus visits, interviews and job offers. Many Airco people also participated in employment seminars and high school presentations, as part of the overall program to encourage high school students to continue their education. For example, a number of Negro employees at Airco headquarters have volunteered their services to the U.S. Vice President's Motivation Task Force, which encourages youngsters to finish school.

Personnel development—In 1967, the Corporate Operating Committee continued its program of discussions with division presidents and corporate staff department heads to evaluate the performance of all key personnel and to assess the requirements for fulfilling management manpower objectives. The discussions served to focus attention on the long-range planning needed for the selection and development of a management group possessing outstanding abilities and judgment.

The company continues to provide financial aid to employees participating in selected outside educational programs. Airco people showed an increased interest in upgrading their skills by taking part in executive courses and in both undergraduate and graduate degree programs.

Training program for college graduates—One of the company's management development efforts came to fruition in 1967, when a pilot group of college graduates completed a two-year, special on-the-job training program. The program provides recent college graduates with an opportunity to receive on-the-job orientation and training while making an immediate contribution to the company on worthwhile projects. After two consecutive, full-year assignments in different areas of the business, such as marketing and production, the first graduates of the program have obtained permanent placement with divisions or departments.

Retirement plan—During 1967, the company adopted a new Pension Plan for Salaried Employees, establishing a more satisfactory relationship between the amount of pensions and final earnings at normal retirement date.

Labor relations—In 1967, the company negotiated 70 collective bargaining agreements out of a total of 151 such agreements in effect at year-end. There were five work stoppages due to labor disputes at five company locations, and all were resolved on generally satisfactory terms.

Safety programs—Almost all categories of safety performance showed improvements. There were 6 per cent fewer disability injuries, 17 per cent fewer non-disabling injuries, 33 per cent fewer permanent disabilities, and a 19 per cent reduction in truck accidents per mile during the year.

Employees at two Airco locations reached notable safety performance milestones. The Central Research and Advanced Engineering Laboratories, Murray Hill, New Jersey, ended the year with over a million man-hours worked without a disabling injury. The Airco Speer Division also attained a record million man-hours of work without a disabling injury at its St. Marys, Pennsylvania, location, which includes the division's headquarters office and a major carbon and graphite plant.

During 1967, 17 Airco chemical and industrial gas plants received "Certificates of Safety Achievement" awarded by the Manufacturing Chemists' Association for having completed a calendar year without a disabling injury.

PICTORIAL HIGHLIGHTS OF 1967

A 4533

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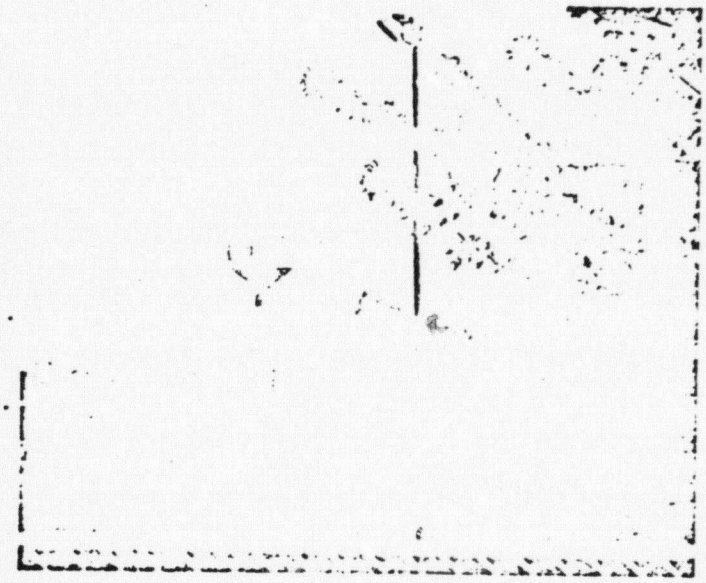
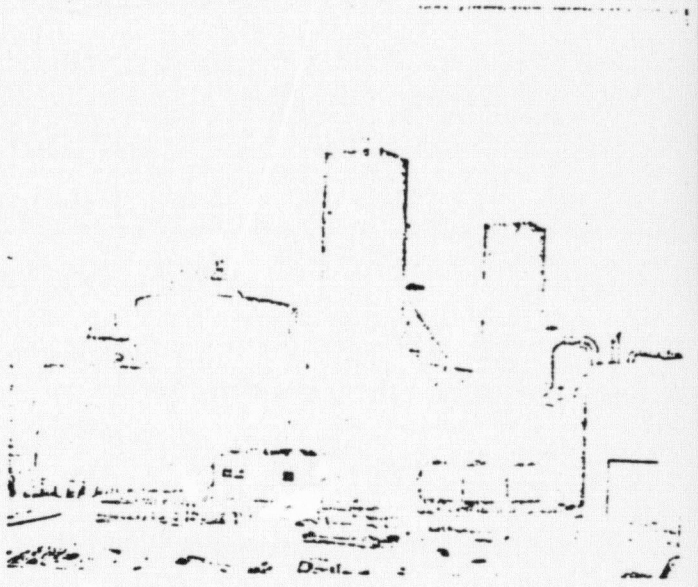
NEW PRODUCTION FACILITIES

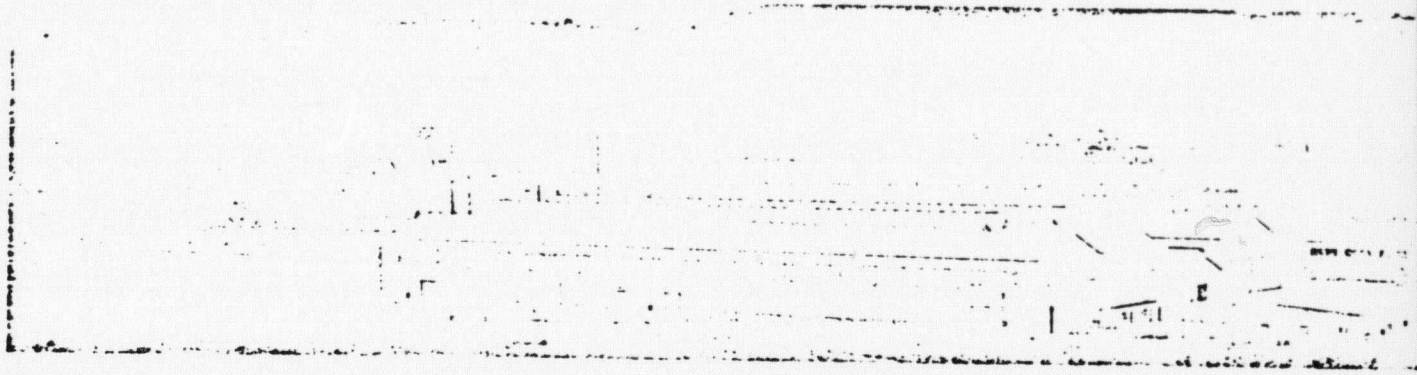
Airco constructed four major plants as well as several other facilities, all designed to increase profitability by producing new and improved products with greater efficiency.

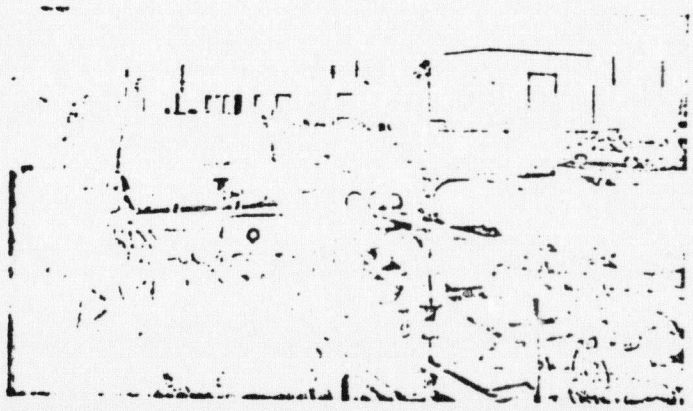
New Welding Wire Plant in Operation—*Top Left*—During the last quarter, Airco Welding Products completed a 140,000 square-foot welding wire plant at the Arroyo site near Chester, W. Va. The Arroyo plant is using new concepts in wire drawing, treating and quality control to produce solid and flux-cored wires in stainless, alloy and mild steels, and in non-ferrous alloys.

Airco's Largest Industrial Gas Plant Completed—*Top Right*—At year-end, the largest air separation plant in the nationwide system operated by Airco Industrial Gases was completed at the Arroyo site. This new facility, with a rated capacity of 2,500 tons per day of oxygen and nitrogen, will be operated and scheduled by the newest computer techniques.









Graphite Electrode Capacity Expanded—*Above*—Recently completed buildings at Airco Speer, St. Marys, Pa., provide added capacity for graphitizing, machining and shipping large graphite electrodes used by the steel and chemical industries.

New Plant for Cryogenic Equipment Manufacturing—*Left*—During the year, Airco Cryogenics completed a 55,000 square-foot equipment plant (background) at Irvine, Calif. near Los Angeles. In addition to facilities for fabricating cryogenic pumps and complete systems, the nine-acre site includes a 30,000 square-foot outdoor test area (foreground) for systems and equipment.

NEW PRODUCTS AND APPLICATIONS

A 4534

Airco introduced several new pieces of equipment, incorporating pioneering technological advancements, as well as many new products and applications offering improved quality and performance over competitive products.

World's Largest Contour Flame Cutting Machine—*Below*—An Airco TAPE-O-GRAPH flame cutting machine with a cutting area 44 feet wide and 82½ feet long, was installed during 1967 by Airco Welding Products at the Chicago steel service center of Joseph T Ryerson & Son, Inc. The unique, automated machine features tape-directed, two-axis numerical control and (at left) a tracing area 10 x 82½ feet for direct scale tracing of templates. This highly automated TAPE-O-GRAPH uses up to 20 motorized torch holders each of which may hold one of two torches, in shape cutting mild or stainless steel sheet and plate up to 12 inches in thickness.

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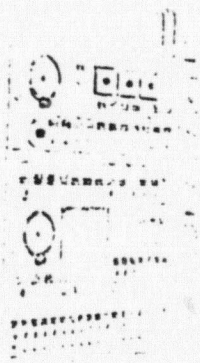


A 4535 EX-122-5

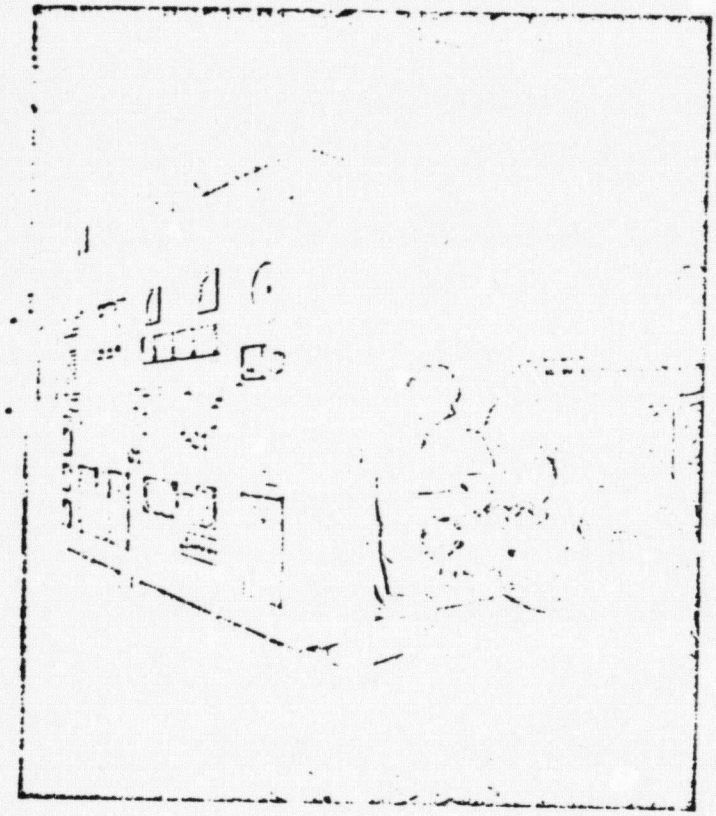
New Products for Research Laboratories—*Top Left*—James Kirk (right) and Stephen Gajarsky check the assembly of a new helium liquefier at Murray Hill, N.J. Airco Kryosystems cryogenic refrigerators and liquefiers, for ultracold temperatures, are now being manufactured and marketed by Airco Cryogenic Division for use in nuclear physics and superconductivity research.

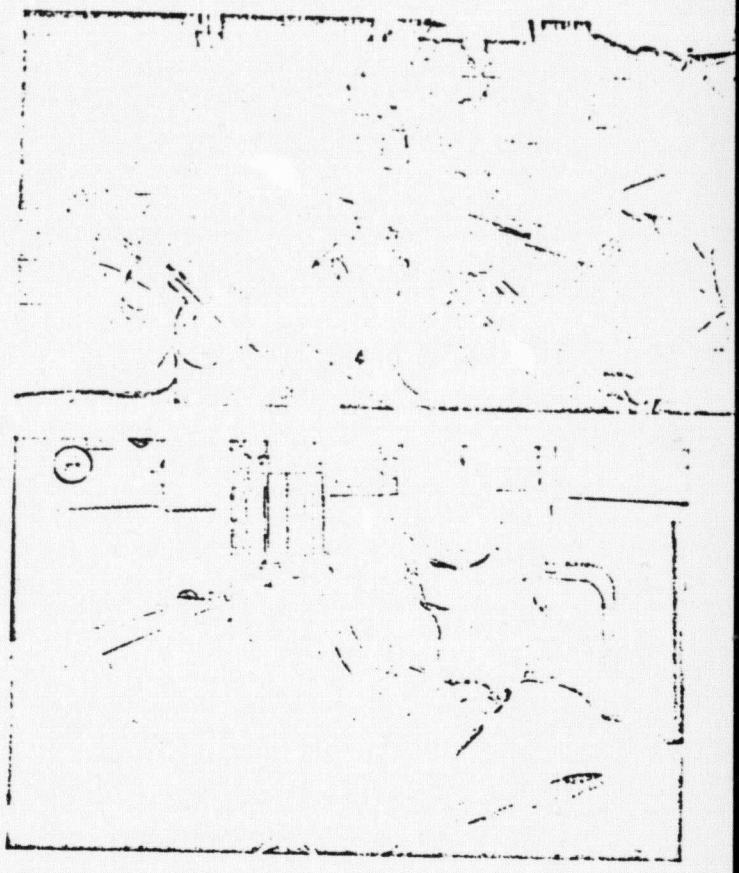
New Product for Anesthetic Measurement—*Bottom Left*—The new Mayo Vapor Analyzer, developed in collaboration with the Mayo Clinic, enables the anesthesiologist to improve his technique and the patient's safety by measuring accurately the anesthetic concentrations being administered. Anesthesiologist demonstrates the Analyzer with Ohio Medical's Series 2000 KINET-O-METER anesthesia machine (in the center background).

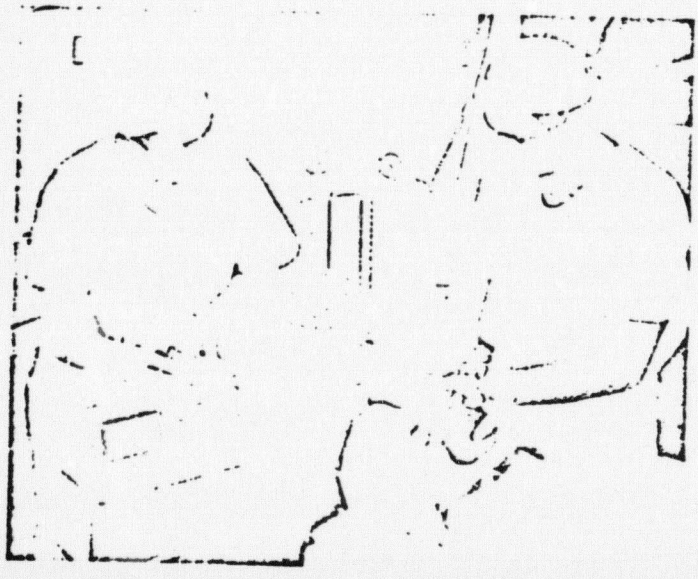
New Welding System—*Top Right*—The TRAC-WELDER units from Airco Welding Products are equipped with extra-long TRAC-ROD electrodes. Since he can operate several of the tripod units simultaneously, the system enables one man to produce three times as much horizontal welding per hour as with hand methods. The Airco system is used in rail car and ship fabrication.

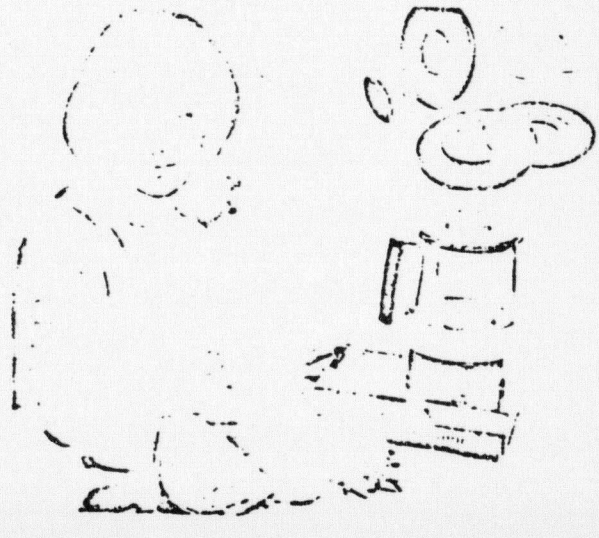
Division Enters Cryosurgery Equipment Field—*Middle Right*—The Ohio Medical Products Division has entered a new medical equipment field with its Thomas CRYOPTOR precision cryosurgery system for cataract extractions. After the lens is freed surgically, the supercold CRYOPTOR probe adheres firmly to the cataract, allowing it to be safely removed.

Food Grade Airco PVC Aids Manufacturing—*Bottom Right*—Propylene-modified "400 Series" polyvinyl chloride resins, developed by Airco Chemicals and Plastics, solved a difficult problem faced by Hamilton Beach in the design and manufacture of a new food blender cover. By using a special food grade Airco resin, Hamilton Beach fabricated (see inset) a food-safe cover with the functional advantages of having flexible and rigid parts bonded together.









New Products and Applications—continued

A 4536

PVA for Paper Coatings—*Top Left*—Paper coatings represent one of the fastest growing markets for polyvinyl alcohol. To meet the demand, Airco Chemicals and Plastics expanded its PVA facilities at Calvert City, Ky., in 1967 to form the largest plant of its type in the nation. At Simkins Industries, New Haven, Conn., the coating unit (shown at the bottom center of the huge cylinder machine) applies PVA coatings to the surface of paperboard to improve brightness, gloss and printing fidelity.

PVC for Clear Food and Drug Containers—*Bottom Left*—The Airco Chemicals and Plastics Division operates a pilot facility at its Plastics Laboratory, Belleville, N.J., using Airco's "400 Series" polyvinyl chloride resins in creating better formulations of PVC compounds for specific products. Foreman Robert Horn starts the formulation of a new PVC compound for use by customers in producing clear plastic bottles such as those shown.

Roadbuilders Use Airco Lime for Ground Stabilizing Applications—*Below*—Thousands of tons of dry lime hydrate purchased from the Airco Alloys and Carbide plant in Louisville, Ky., were used in 1967 to stabilize Mississippi soils for road beds. Mississippi Aggregate Co., recently used the division's dry lime hydrate to stabilize this highway bed near Vicksburg, Miss. Contractors in Alabama, Arkansas and Texas also are using Airco lime for roads.

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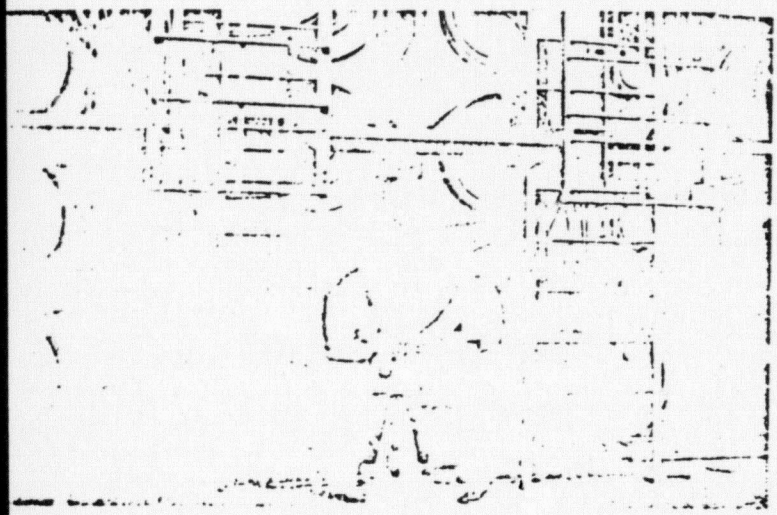

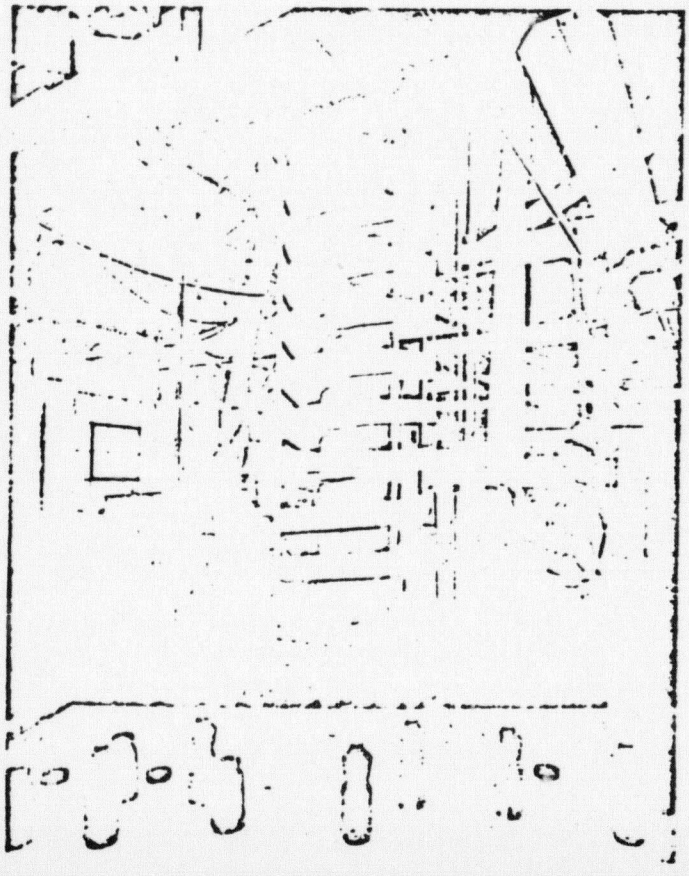

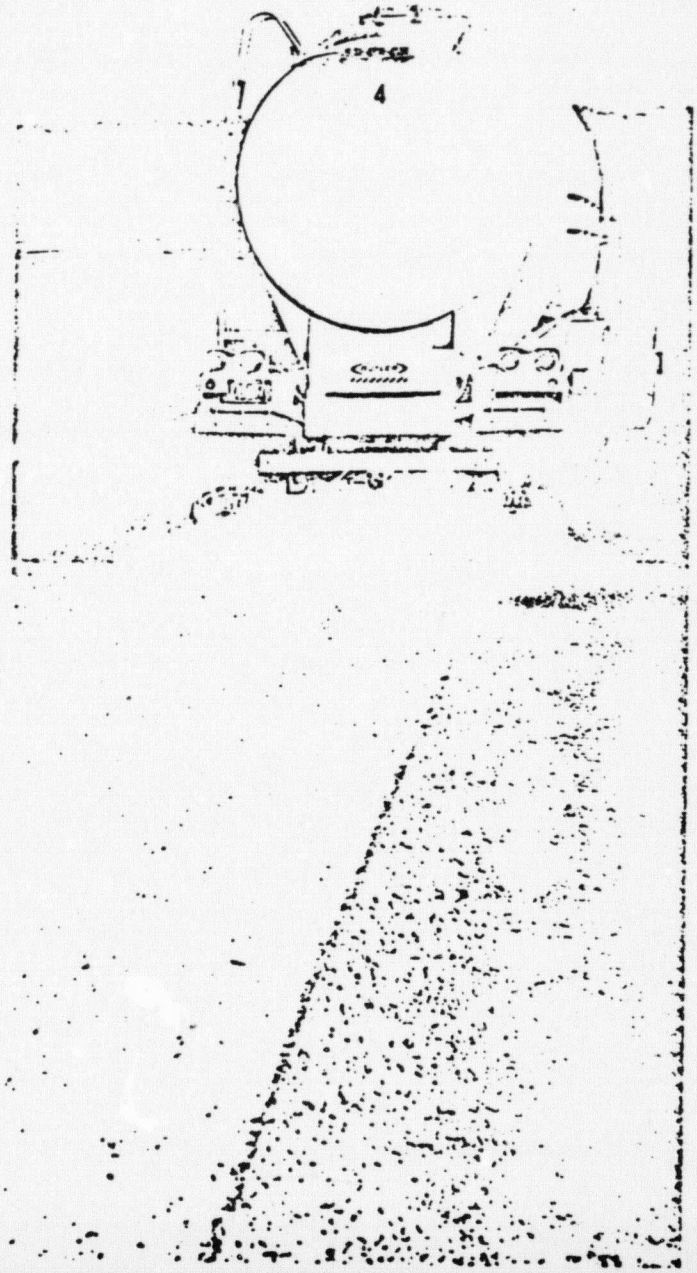

IMPROVED TECHNICAL COMPETENCE

A 4537

The company benefitted significantly from the introduction of more sophisticated management and development techniques, advanced training methods for distributors and customers, and through the adoption of substantially improved production processes.

New Manufacturing Technique for Alloys—*Top Left*—A new technique for producing and casting ferroalloys, developed by Airco Alloys and Carbide, permits the pouring of up to 150 tons of ferroalloys at one time, as shown at the division's plant in Niagara Falls, N.Y. The new Airco process produces ferroalloys with superior characteristics at lower cost.

Computer System Aids Production and Shipping—*Top Right*—Ed Higley, at control console of IBM 360 computer at Airco Speer electronic components plant in Bradford, Pa., checks one of several visual display devices that give instant access, at key plant locations, to inventory and order status of millions of resistors.

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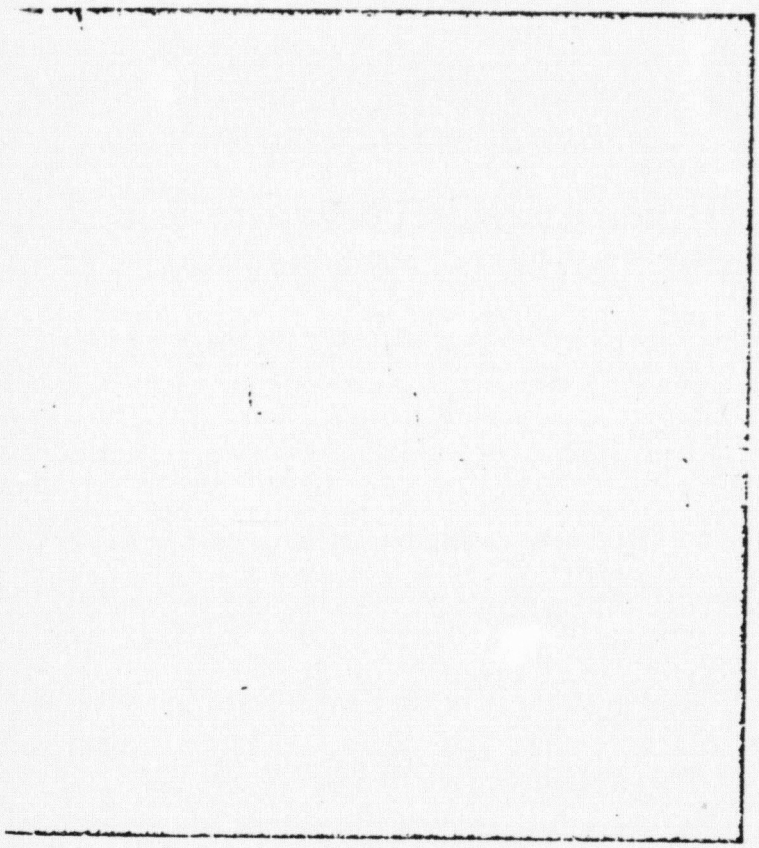
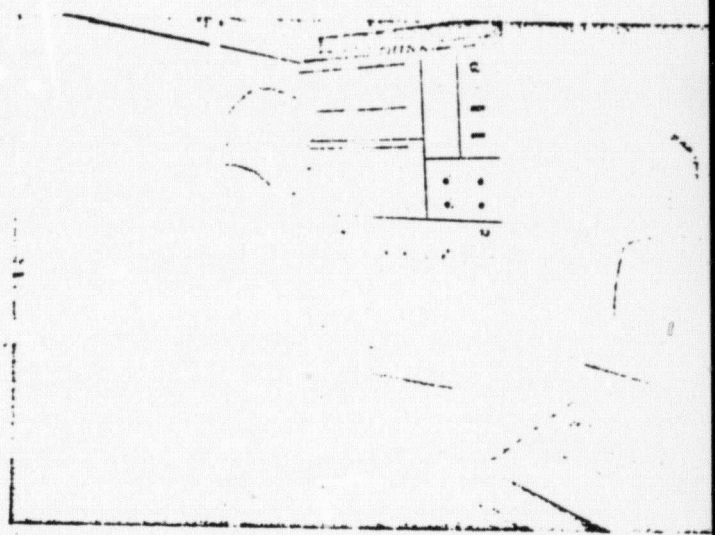
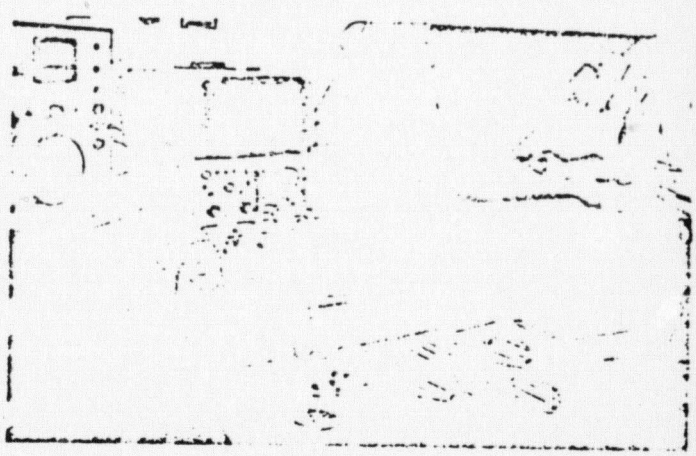






Special Testing Services—*Above*—Carbon brushes for small electrical motors used in auto heaters and air conditioners are prepared for sound frequency tests by Elwood Smith in Noise Analysis Room at the Airco Speer Technical Service Lab, St. Marys, Pa.

Specialized Training Required for Operation of Complex Equipment—*Left*—As equipment becomes more and more sophisticated, technical instruction for distributors and customers becomes mandatory. One of several Training Centers operated by Airco Welding Products is located in Broadview, Ill. Training Manager George Wilson (standing, second from left) instructs a class in cutting machines, using an Airco Model 250 DUOGRAPH for demonstration.

ACQUISITIONS AND JOINT VENTURES

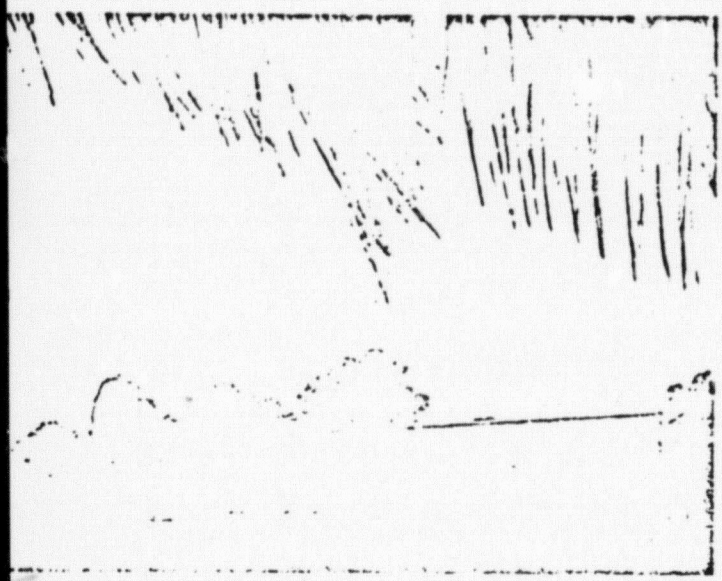
A 4538

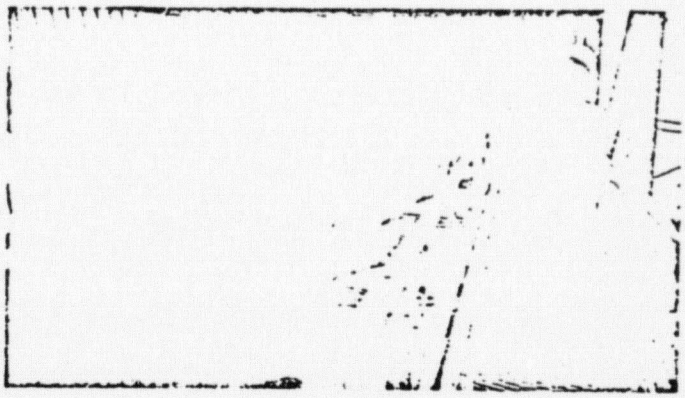
Airco completed several important acquisitions and joint ventures—all with companies in business areas which are generally compatible with Airco's present operations.

Manufacturer of Unique Medical Components Acquired—*Top Left*—Now merged into the Ohio Medical Products Division is Galleher, Inc., and its Elastomers plant, located on a ten-acre site in Fort Myers, Fla. Elastomers fabricates conductive rubber products for use with Ohio Medical's anesthesia apparatus.

Joint Venture Creates One of the Largest Chemical Plant Construction Firms—*Top Right*—In October, Airco and British Oxygen Company formed a major joint venture with over 1,700 employees. The venture is one of the world's largest in designing and constructing low temperature plants. In the United States, the firm operates under the name Airco-BOC Cryogenic Plants Corporation, with headquarters in Murray Hill, N.J. The manufacturing functions of the venture (photo shows air separation column assembly area) are performed near London at Edmonton, U.K., where the British and overseas counterpart is headquartered, operating as BOC-Airco Cryogenic Plant Limited.

EX-172-V



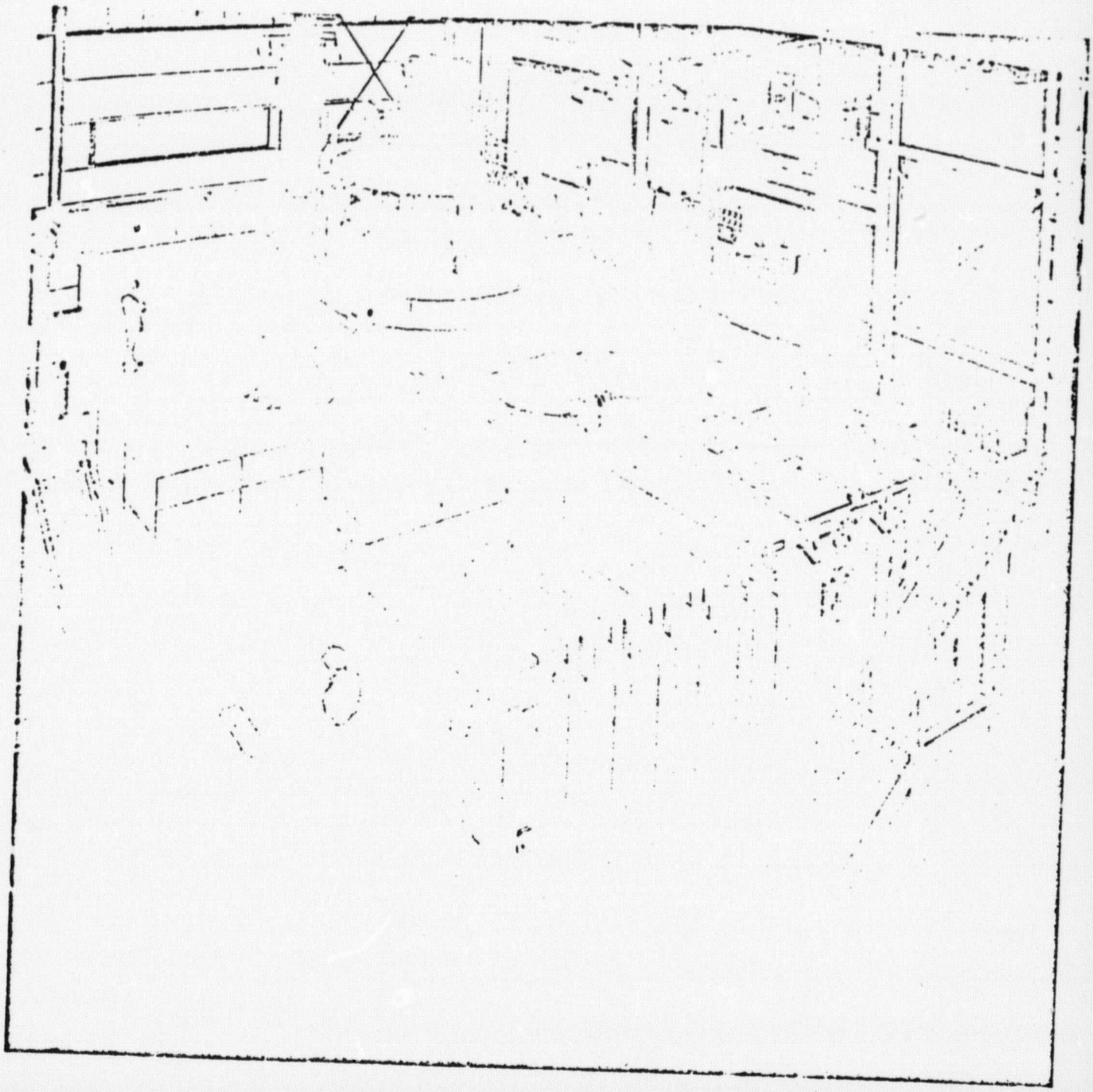


Airco Plans to Play Key Role in Resurging Coal Industry—*Above*—In September 1967, Airco first entered the coal business with the announcement it had concluded a contract to supply coal to a major utility. James Meadows, from the Airco Alloys and Carbide Division, examines coal conveyed from Airco's mine to a processing plant. In late 1967, Airco announced plans to acquire a leading coal producer, the Maust Coal and Coke Corporation, before the end of the first quarter.

Airco Acquires Electron-Beam Technology—*Left*—Airco Temescal, which was acquired and became a division in June, is a leader in the field of high-vacuum electron-beam processing equipment. Charles W. Hanks, Temescal's Director of Development, examines a mounted 10 KW electron-beam gun at the division's plant in Berkeley, Calif. The system is used in melting or evaporating materials, or in coating surfaces such as glass, plastics and metals.

A 4539 **Innovations in Vacuum Induction Melting Field by Airco's New Division**—*Below*—Airco Temescal designed, built and assembled the vacuum system for a versatile 15-ton vacuum induction melting facility installed at the New Hartford, N.Y., Special Metals Corp. subsidiary of Allegheny Ludlum Steel Corporation. The induction crucible, shown with the top moved aside, processes superalloys into an ingot form that later will be worked by other companies into various shapes for use in special aerospace equipment, and other high strength, high temperature applications.

CX-172-W



RESEARCH AND ADVANCED ENGINEERING

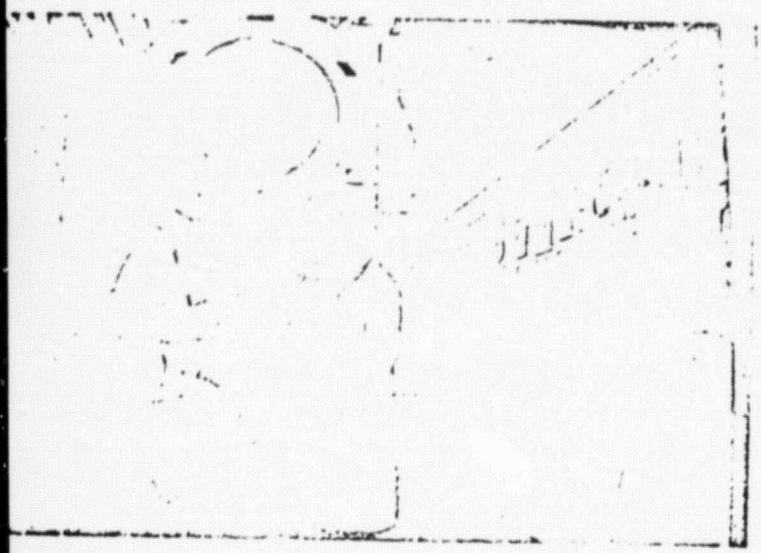
A 4540

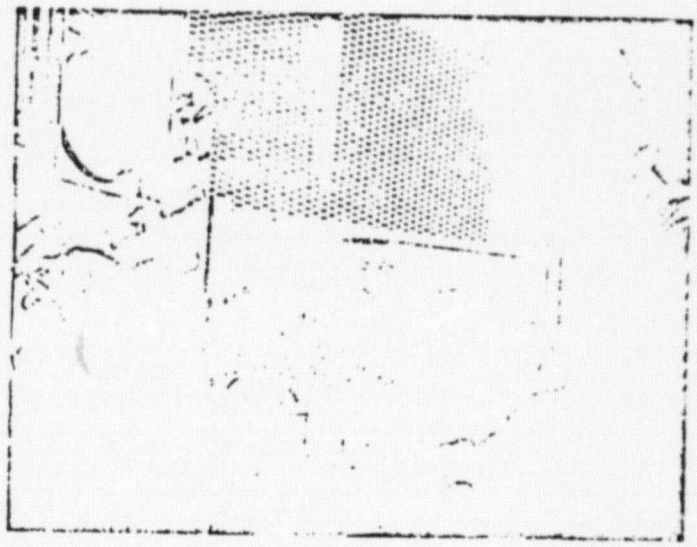
Programs are aimed at developing new and improved products, processes and manufacturing techniques that will add significantly to Airco's future growth and profitability.

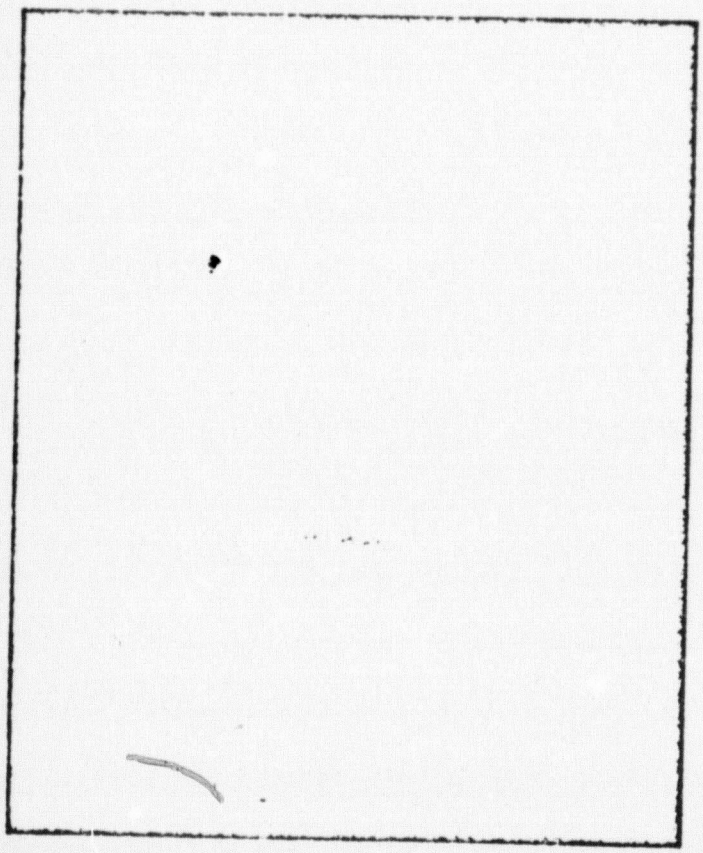
Ocean Engineering at Murray Hill, N.J.—*Top Left*—A new commercial deep diving facility, to be operated by International Underwater Contractors, will enable divers to work for the first time during extended periods at depths to 1,000 feet. Deck decompression chamber and life support controls (right) are being prepared for tests by (left to right) George Spies, Bill Campbell and Fred Gunther of Airco's Advanced Engineering Department.

Central Research for Human Welfare—*Top Right*—Dr. Huey Auger's pharmacological research at Murray Hill is helping Airco develop new anesthetics with superior performance characteristics.

EX-172-X







Graphite Quality Research—*Above*—James DiNicola, at the Airco Speer Research Lab, Niagara Falls, N.Y., removes test sample for concentration measurement from model corrosion cell used in accelerated studies of graphite anode wear in caustic chlorine cells. **Metallurgical Process Research**—*Left*—Metallurgical studies at Murray Hill include metal purification by gas injection through a graphite tube into metal brought to molten state.

A 4541

Stressed Development of New Chemical Products. Special Emphasis Given Cryogenics and Metallurgical Programs. Strong Technical Backup Provided All Divisions of the Corporation.

Ex-72-Y

Airco employs more than 1,100 scientific and engineering personnel in research and closely related technical areas at 20 locations in the United States. In 1967, the company invested $12.8 million in research and development activities, or approximately 7 per cent more than the $12 million invested during 1966.

In addition to the constant search for new products and new uses for existing products, Airco's research and development programs are concerned equally with the economic efficiency of the company's processing and manufacturing operations. Continually emphasized is the importance of keeping abreast of new processing technologies and lower-cost production techniques as key avenues to increased profitability.

R & D facilities — Airco performs basic long-range research at its 130,000 square-foot Central Research and Advanced Engineering Laboratories in Murray Hill, New Jersey. The programs are conducted in four broad areas: metallurgy, physics, cryogenics and chemistry. Currently under construction at Murray Hill is a new wing, which will increase laboratory and office space by over 16 per cent. Completion is scheduled for mid-1968.

Exploratory and applied research in the fields of carbon, graphite and electronic components are conducted at the Airco Speer Division's 60,000 square-foot laboratory in Niagara Falls.

Translating basic research into product and process reality is the responsibility of development laboratories. Airco has 18 such facilities at major divisional manufacturing plants. The largest development laboratories are located at Middlesex, New Jersey (chemical applications), and Union, New Jersey (welding, and cryogenic products and processing).

Major research programs — Airco's research and development programs are related directly to the principal business interests of the company.

A major research activity is in the chemicals and plastics area, where extensive investigations are being conducted to develop new and advanced vinyl resins, which are suitable for both flexible and rigid applications. In addition, new copolymers are under development for use in coatings and textile sizing.

In cryogenics, special attention is being given to the development of superconducting materials for use in physics research, in compact high-powered electric motors, and in future power generation and transmission equipment. The development of new cryogenic pumps, helium liquefiers, various devices and items of hardware, rounds out Airco's extensive cryogenics research activity.

Two broad programs are under way in the metallurgical area. Special emphasis is being given to maximizing the benefits of the new ferroalloy casting technique announced by Airco in mid-1967. The other metallurgical program, which is being conducted in close cooperation with the newly-acquired Temescal organization, involves electron-beam refining of special alloys.

Deep diving system developed — In 1967, a team of Airco engineers, in a joint project with International Underwater Contractors, Inc., developed a diving system designed to permit man to work underwater for extended periods of time at depths to 1,000 feet. The Airco-developed environmental system controls the breathing gas supply for the entire complex, maintains the environment in a chamber-dwelling unit, controls life support functions in a diving bell, and monitors all atmospheric conditions.

Many other programs are well under way at the Airco laboratories, including the development of agents and systems for anesthesia; and welding processes for fabricating tough weldments in high-strength steel plate.

A 4542

Ex-172-2

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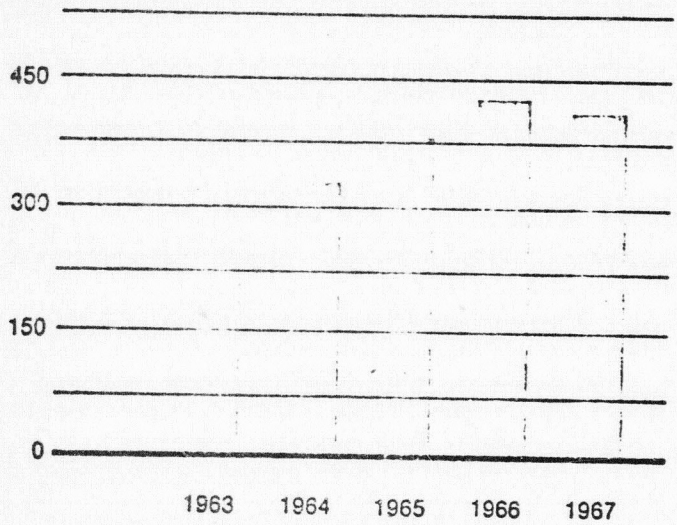
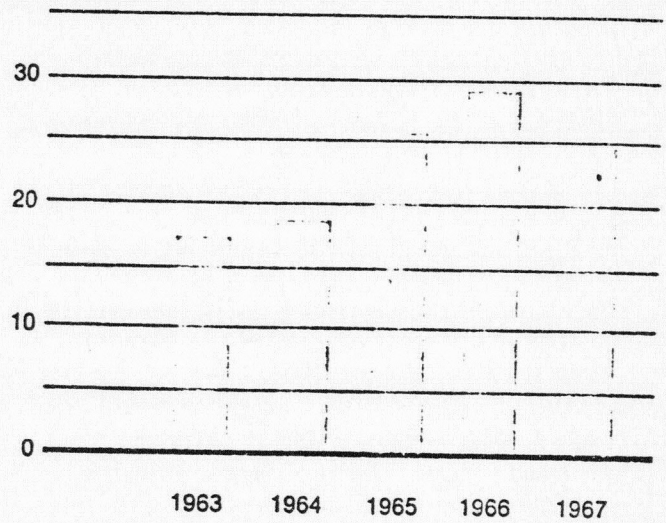
FIVE-YEAR TRENDS

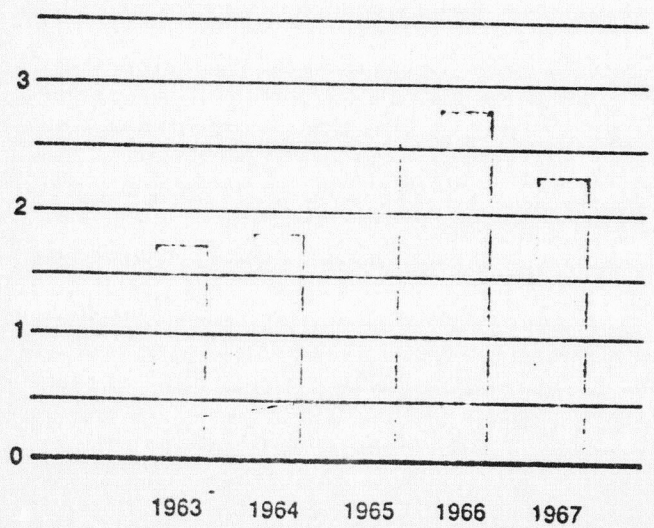
NET SALES
(millions of dollars)



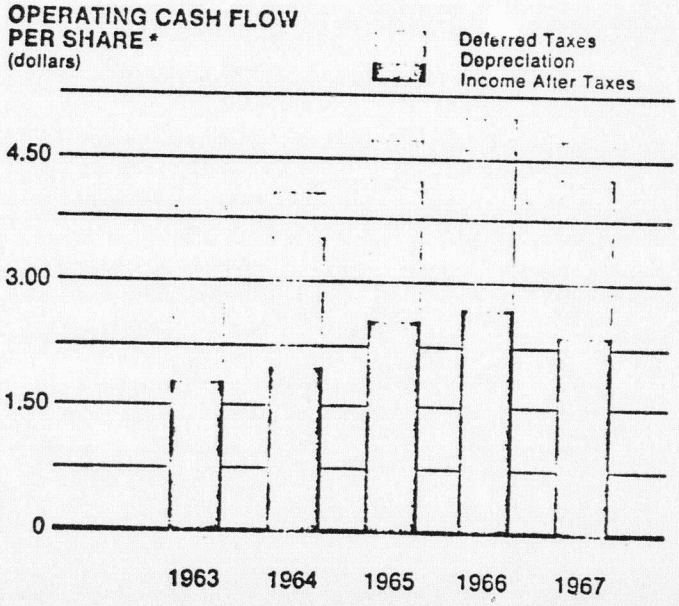
INCOME*
(millions of dollars)



EARNINGS PER SHARE*
(dollars)



OPERATING CASH FLOW PER SHARE*
(dollars)



*After giving effect to the 2-for-1 stock split, April 26, 1967, and before extraordinary charges

A 4543

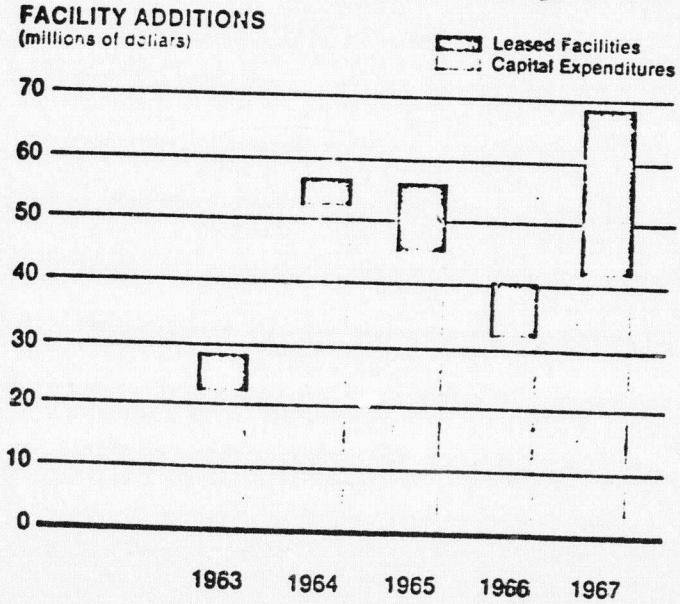
CX-172-2-

Facility Additions at Record Level. Major Expansion and Modernization Programs Completed for All Key Airco Product Areas.

During 1967, Airco's facility additions established an all-time high of $69.3 million for new and improved production installations and for distribution equipment. This compares with $41.7 million in 1966. These amounts include facilities financed under long-term lease arrangements, amounting to $26.7 million in 1967, and $8.8 million in 1966.

Generally, the company's construction and modernization programs ran according to schedule throughout 1967. The major projects were in two of Airco's key product areas—industrial gases and graphite products. The largest amount was expended for the construction of two huge air separation plants, the 2,500-ton-a-day facility at Arroyo, West Virginia, and the 1,200-ton-a-day facility at Bethlehem, Pennsylvania. These installations are the largest air separation plants Airco has built in its 52-year history.

In the graphite products area, where the second largest sum was invested, Airco constructed new buildings and installed new production and materials handling equipment for the manufacture of graphite electrodes and anodes at existing plants in St. Marys and Niagara Falls.



Other major projects during 1967 included the construction of a new welding wire drawing and processing plant at Arroyo, West Virginia; a major expansion of the polyvinyl alcohol plant at Calvert City, Kentucky; new carbide, acetylene and dry lime hydrate processing and materials handling equipment at Louisville and Calvert City, Kentucky; and preliminary construction work for the installation, in 1968, of new ferroalloy furnaces at Calvert City, Kentucky, and Charleston, South Carolina.

Facility additions in 1968 are expected to approximate the 1967 total amount. In 1968, as in 1967, substantial expansion and modernization programs are planned for every major product area of Airco's widely diversified operations.

Write-off of obsolete facilities—In 1967, Airco established a reserve in the amount of $12 million, after income taxes, to cover the write-off of obsolete facilities in Airco's industrial gas and chemical businesses.

This extraordinary charge for obsolescence results substantially from the construction of larger, more efficient production and distribution facilities in which a record $245 million has been invested in the past five years. As these new facilities become available, our smaller, less efficient facilities are being phased out.

While the extraordinary charge reduced our 1967 net income, the book value of the obsolete facilities becomes deductible for Federal income tax purposes as the facilities are disposed of. The tax deduction has the beneficial effect of increasing the cash available to the company to assist in financing future expansion and modernization programs.

In connection with the decision to establish this reserve, the company has increased depreciation rates on certain of its other facilities to reflect its current estimates of the future impact of economic obsolescence. This increase in depreciation will offset substantially the effect on future earnings that the reduction in depreciation from the extraordinary charge otherwise would have.

A 4544

Ex-172-2-2

CONSOLIDATED BALANCE SHEET DECEMBER 31, 1967 AND 1966

ASSETS	1967	1966
CURRENT ASSETS		
Cash	$ 14,738,000	$ 14,010,000
Short-Term Notes (at cost which approximates market value)	2,231,000	4,839,000
Notes and Accounts Receivable (less allowances for doubtful accounts—1967, $952,000; 1966, $826,000)	68,149,000	59,815,000
Inventories (Note B)	83,283,000	77,385,000
Prepaid Taxes, Insurance, and Other Expenses	1,991,000	2,108,000
Total Current Assets	170,392,000	158,157,000
PROPERTY, PLANT, AND EQUIPMENT—NET (Note C)	282,809,000	274,815,000
INVESTMENTS AND MISCELLANEOUS RECEIVABLES	1,982,000	1,224,000
DEFERRED CHARGES	5,158,000	5,649,000
GOODWILL, PATENTS, AND TRADEMARKS (net of amortization)	6,858,000	6,716,000
TOTAL	$467,199,000	$446,561,000

See accompanying notes to financial statements

A 4545

EX-122-2-3

LIABILITIES AND STOCKHOLDERS' EQUITY	1967	1966
CURRENT LIABILITIES		
Accounts Payable	$ 21,748,000	$ 22,069,000
Currently Maturing Long-Term Debt	1,063,000	2,917,000
Dividend Payable	—	3,882,000
Accruals	10,007,000	10,294,000
Federal and Foreign Taxes on Income	3,566,000	6,654,000
Total Current Liabilities	36,384,000	45,816,000
LONG-TERM DEBT (less currently maturing portion) (Notes D and E)	140,536,000	131,151,000
DEFERRED INCOME TAXES (Note F)	47,626,000	41,791,000
STOCKHOLDERS' EQUITY (Notes E and J)		
Common Stock:		
Without par value; authorized—7,500,000 shares; issued—5,176,534	—	100,463,000
$1 par value; authorized—20,000,000 shares; issued—11,091,804	11,092,000	—
Common stock and capital surplus of pooled companies		153,000
Capital in Excess of Par Value (Note G)	104,020,000	
Retained Earnings (Note D)	127,541,000	127,187,000
Total Stockholders' Equity	242,653,000	227,803,000
TOTAL	$467,199,000	$446,561,000

A 4546

EX-172-2-4

STATEMENT OF CONSOLIDATED INCOME

	1967	1966
Net Sales	$413,083,000	$430,409,000
Deductions		
Cost of Goods Sold (before depreciation)	281,841,000	297,586,000
Selling, Administrative, and Other Expenses	64,160,000	59,159,000
Provision for Depreciation	21,059,000	19,604,000
TOTAL	367,060,000	376,349,000
Net Operating Income	46,023,000	54,060,000
Other Income—Net	1,447,000	736,000
TOTAL	47,470,000	54,796,000
Interest Expense	6,723,000	6,034,000
Income Before Federal and Foreign Taxes on Income	40,747,000	48,762,000
Federal and Foreign Taxes on Income (Note F)		
Current	10,197,000	14,207,000
Deferred—Net	5,835,000	5,248,000
TOTAL	16,032,000	19,455,000
Income Before Extraordinary Charge	24,715,000	29,307,000
Extraordinary Charge Less Applicable Federal Income Tax (Note H)	12,000,000	—
Net Income	$ 12,715,000	$ 29,307,000
Per Share of Common Stock (Note I)		
Income Before Extraordinary Charge	$2.28	$2.77
Extraordinary Charge, Net of Income Tax	1.11	—
Net Income	$1.17	$2.77

STATEMENT OF CONSOLIDATED RETAINED EARNINGS

	1967	1966
Balance at Beginning of Year, as Previously Reported	$125,366,000	$113,340,000
Adjustment as of January 1, 1966 for Retained Earnings of Pooled Companies Acquired in 1967 (Note A)	1,821,000	1,476,000
Balance at Beginning of the Year, as Restated	127,187,000	114,816,000
Net Income	12,715,000	29,307,000
TOTAL	139,902,000	144,123,000
Dividends:		
Airco—Common Stock (per share—1967, $1.125*; 1966, $1.625*)	12,219,000	16,800,000
By Pooled Companies	142,000	136,000
Total Dividends	12,361,000	16,936,000
Balance at End of Year	$127,541,000	$127,187,000

*Dividends paid were $1.50 per share in 1967 and $1.25 in 1966. The dividend declared in December 1966 ($.375 per share) for payment in March 1967 normally would have been declared in January 1967.

See accompanying notes to financial statements

EX-172-
2-5

NOTES TO FINANCIAL STATEMENTS

A. POOLINGS OF INTERESTS AND ACQUISITIONS

During 1967, the Company acquired in poolings of interests the net assets and businesses of Temescal Metallurgical Corporation, Gallehor, Inc., and Elastomers, Inc., in exchange for 266,500 shares of its Common Stock. The accounts of the acquired companies are included in the accompanying financial statements for 1966 and 1967.

On December 20, 1967, the Company entered into an agreement with Maust Coal and Coke Corp. whereby Airco would issue 509,626 shares of Common Stock and 25,000 shares of Series A Convertible Preferred Stock in exchange for the assets, properties, and business of Maust. This acquisition, which is subject to the approval of the stockholders of Maust and to the fulfillment of certain other conditions, will be treated as a pooling of interests.

B. INVENTORIES

Inventories stated at the lower of average cost or market at December 31, 1967 and 1966 are as follows:

	1967	1966
Finished Goods	$ 35,743,000	$ 33,475,000
Goods in Process	15,132,000	12,360,000
Raw Materials and Supplies	32,408,000	31,550,000
Total Inventories	$ 83,283,000	$ 77,385,000

C. PROPERTY, PLANT, AND EQUIPMENT

A summary of property, plant, and equipment (at cost) at December 31, 1967 and 1966 is as follows:

	1967	1966
Land	$ 7,196,000	$ 7,266,000
Buildings and Leasehold Improvements	86,401,000	82,174,000
Machinery and Equipment	365,281,000	354,024,000
Construction in Progress	23,689,000	14,976,000
Total	482,567,000	458,440,000
Less: Accumulated Allowances for Depreciation, Amortization and Obsolescence	199,758,000	183,625,000
Property, Plant, and Equipment—Net	$282,809,000	$274,815,000

Allowances for depreciation and amortization are accumulated on a straight-line basis.

D. LONG-TERM DEBT

Long-term debt outstanding at December 31, 1967 and 1966 is summarized as follows:

	1967	1966
3⅞% Convertible Subordinated Debentures Maturing in 1987 (cash redemptions to commence in 1977)	$ 32,489,000	$ 44,992,000
Twenty-year 2¾% Sinking Fund Debentures Maturing in 1967	—	1,900,000
Notes Payable to Banks	28,875,000	8,420,000
Promissory Notes:		
4¼% Maturing in 1973	1,555,000	1,820,000
4.85% Maturing in 1988 (payments of $3,330,000 annually to commence in 1974)	50,000,000	50,000,000
5% Maturing in 1982	22,000,000	22,500,000
Mortgages	6,660,000	4,436,000
Total	141,599,000	134,068,000
Less: Instalments included in Current Liabilities	1,063,000	2,917,000
Long-term Debt (less currently maturing portion)	$140,536,000	$131,151,000

During 1967, an agreement between the Company and certain banks was amended whereby the banks are committed to lend $52,500,000 to Airco through December 31, 1969, of which $28,875,000 is outstanding at December 31, 1967. The notes issued pursuant to the agreement bear interest at the best rate established, from time to time, by one of the participating banks until August 1, 1968, and thereafter at ¼% above such rate in effect from time to time. At December 31, 1967 the rate of interest in effect was 6%. Repayment of these notes will be made in two equal instalments on December 31, 1970 and 1971.

The amounts of long-term debt payable annually during the five-year period ending December 31, 1972 are as follows: 1968, $1,063,000; 1969, $1,554,000; 1970, $16,002,000; 1971, $16,013,000; and 1972, $1,686,000. Subject to certain limitations and the payment of premiums, prepayments on all long-term debt may be made.

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payment of cash dividends and the purchase, redemption, or retirement of the Company's capital stock. As of December 31, 1967, under the most restrictive of these provisions, the amount available for such expenditures was approximately $53,055,000.

E. CAPITAL STOCK

During 1967, the Certificate of Incorporation was amended to change each share of Common Stock without par value into two shares of Common Stock of $1 par value each and to increase the authorized shares from 7,500,000 to 20,000,000 shares. In addition, the par value of each share of preferred stock was changed from $100 to $5 and the number of authorized shares was increased to 1,000,000. None of the preferred shares was issued at December 31, 1967.

The summary of changes in shares of outstanding Common Stock (adjusted for the 2-for-1 stock split in 1967) is as follows:

Shares outstanding at December 31, 1966	10,353,068
Shares issued:	
On conversion of $12,503,000 principal amount of 3⅞% Convertible Debentures	400,096
Under employee stock investment plan	39,187
Under stock option plans	32,953
For pooled companies	266,500
Shares outstanding at December 31, 1967	11,091,804

A total of 1,039,648 shares of authorized unissued Common Stock is reserved for issuance, at $31.25 per share, upon the conversion of the 3⅞% Convertible Subordinated Debentures at any time up to August 15, 1987. Additional shares of Common Stock are also reserved for stock options and the stock investment plan as shown in Note J.

F. FEDERAL TAXES ON INCOME

The Company's provision for current Federal income taxes reflects net reductions attributable to the use of liberalized depreciation and guideline depreciation rates for tax purposes only. Provision has been made for deferred income taxes in an amount equivalent to such net reductions.

The 1967 and 1966 current provisions for Federal income taxes have been reduced by investment credits of $3,037,000 and $3,500,000, respectively.

The provisions for current Federal taxes on income are before reductions of $1,318,000 and $343,000 in 1967 and 1966, respectively, arising from losses realized in those years but provided for in reserves for losses on facility abandonments.

continued

Ex-172-
2-6

NOTES TO FINANCIAL STATEMENTS—continued

G. CAPITAL IN EXCESS OF PAR VALUE

Transactions in capital in excess of par value during the year ended December 31, 1967 are as follows:

Transfer from Common Stock as of April 27, 1967 upon change of Common Stock without par value to Common Stock—$1 par value (less expenses)	$ 91,946,000
Excess of amounts received over the par value of Common Stock issued:	
On conversion of 3⅞% Convertible Debentures	10,833,000
Under employee stock investment plan	1,110,000
Under stock option plans	387,000
Excess of par value of Common Stock issued over amounts of capital stock and capital surplus of pooled companies and expenses of combinations	(256,000)
Balance at December 31, 1967	$104,020,000

H. EXTRAORDINARY CHARGE

In 1967, the Company established a reserve for abandonment of obsolete facilities by an extraordinary charge to income of $12,000,000 (net of related income tax credits of $8,923,000) to cover the replacement of smaller plants which have become obsolete. As a result of recent technological changes the Company is able to construct larger scale facilities.

I. EARNINGS PER SHARE

Income before extraordinary charge, extraordinary charge and net income per share of Common Stock have been computed on the average number of shares of Common Stock that would have been outstanding on a combined basis during each year after retroactive adjustment for the 2-for-1 stock split in 1967 and for stock issued in poolings of interests. Assuming the 3⅞% Convertible Subordinated Debentures outstanding at the end of each year had been converted into shares of Common Stock as of the beginning of each year and after adjustment of earnings for applicable debenture interest and issue expense and related Federal income tax, the pro forma per share amounts would be as follows:

	1967	1966
Income Before Extraordinary Charge	$2.13	$2.51
Extraordinary Charge (Note H)	(1.00)	—
Net Income	$1.13	$2.51

J. STOCK OPTIONS AND STOCK INVESTMENT PLAN

Stock Options—During 1967, the stockholders approved the 1967 stock option plan which provides for the granting of options for 100,000 shares of Common Stock to employees recommended by the Board of Directors, including options granted in substitution for outstanding options of acquired companies. Terms of such options in substitution for existing options in general reflect the terms of the options of the acquired company outstanding on the date of acquisition. In all other cases, the price of the option will be 100% of the market value on the date of grant; the option period will not exceed five years; and options become first exercisable cumulatively as to 20% of the options twelve months after date of grant and an additional 20% each twelve months thereafter, except that the final 20% becomes exercisable sixty days before the expiration of the sixtieth month. No options under the 1967 plan may be granted after April 26, 1972, with the Board of Directors having power to extend such date up to April 26, 1977.

Under the 1953 and 1957 stock option plans, options to purchase shares of the Company's Common Stock were granted prior to 1963 to certain executive employees (including officers) and are now outstanding at a price of not less than 95% of the fair market value of the shares on the grant date. Such options are exercisable in cumulative instalments, commencing 18 months after the date of grant, with option periods not to exceed ten years from the grant date. Stock options have also been granted to persons employed subsequent to June 30, 1962 (including three officers), at the quoted market price on the date of grant, with the other provisions of the option agreements being similar to those granted under the 1957 plan, except that options granted subsequent to 1963 have an option period of five years and are exercisable in cumulative instalments commencing 12 months from the date of grant. In addition, substitute stock options have been granted in connection with obligations relating to the acquisition of other corporations.

The changes in stock options, expressed in shares of Common Stock, after giving effect to the 2-for-1 stock split, are summarized for the year as follows:

	1967 Stock Option Plan	1953 and 1957 Stock Option Plans	Other Stock Options	Substitute Stock Options
Options Outstanding January 1, 1967	—	170,338	64,250	8,526
Options Granted	4,188	—	—	—
Options Exercised	(3,490)	(20,821)	(6,500)	(2,142
Options Terminated	—	(12,376)	(3,750)	(176
Options Outstanding December 31, 1967	698	137,141	54,000	6,208
Aggregate Option Price December 31, 1967	$10,000	$4,929,000	$1,591,000	$146,000

The aggregate option price for options granted during the year was $62,000; the aggregate option prices for options exercised were $52,000 for the 1967 plan, $553,000 for the 1953 and 1957 plans, $183,000 for other stock options, and $53,000 for substitute options.

At December 31, 1967, 95,812 shares of Common Stock were available for the granting of additional options. On January 24, 1968 the Board of Directors authorized the issuance of 64,000 of these shares to officers and employees of the Company at an aggregate option price of $1,769,000.

Stock Investment Plan—Pursuant to the employee stock investment plan, the Company is offering up to a total of 400,000 shares (adjusted for the 2-for-1 stock split) of its unissued Common Stock to employees eligible to participate in the plan at a price determined by the last sale of the Company's Common Stock on the New York Stock Exchange on certain quarterly dates, except that no sale may be made under the plan at a price of less than $13.34 a share. For each five shares of Common Stock purchased by a participating employee, the Company will contribute to the employee one additional share of its Common Stock pur-

EX-172-2-2

chased in the open market. Through 1967, 323,161 shares, for an aggregate consideration of $9,683,000, had been issued to 6,359 employees under the plan, and 60,486 shares were purchased for such employees at a cost of $1,809,000.

Of the total authorized and unissued shares of Common Stock, 370,698 shares were reserved at December 31, 1967 for issuance for stock options and the employee stock investment plan described above. The plans may be suspended or discontinued by the Board of Directors at any time, but no such action can affect options already granted.

K. RETIREMENT PLANS

The Company and its subsidiaries maintain retirement plans covering substantially all officers and employees. It is the Company's policy generally to fund the pension cost accrued. The total pension expense for the years ended December 31, 1967 and 1966 was approximately $1,980,000 and $1,640,000, respectively.

During 1967, changes were made in the major plans as to (1) the actuarial cost method used, (2) the actuarial assumptions used, and (3) the benefit structure. These changes eliminated substantially all the unfunded prior service costs at December 31, 1967 and had no material effect on net income during the year then ended.

L. COMMITMENTS

The unexpended portion of amounts authorized for capital expenditures at December 31, 1967 approximated $51,000,000, as to which commitments have been made for approximately $6,700,000. At the same date the Company was lessee under leases, ending more than three years after that date (generally within a period of from ten to fifteen years), having aggregate annual rentals of approximately $12,900,000. Of this amount, $6,500,000 relates to tonnage gas plants supplying customers under long-term sales contracts which provide for aggregate minimum revenues covering rentals.

In connection with a joint venture, the Company is committed to guarantee up to $5,800,000 of aggregate borrowings of the venture. The amount of outstanding debt relating to such guarantee is $1,753,000 at December 31, 1967.

ACCOUNTANTS' REPORT

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TWO BROADWAY
NEW YORK 10004

To the Stockholders of
Air Reduction Company, Incorporated

We have examined the consolidated balance sheet of Air Reduction Company, Incorporated and subsidiaries as of December 31, 1967 and the related statements of consolidated income, retained earnings, and source and application of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned statements present fairly the financial position of the companies at December 31, 1967 and the results of their operations and the source and application of their funds for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Haskins & Sells

March 6, 1968.

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TEN-YEAR FINANCIAL REVIEW Figures in thousands except per share data

	1967 (1)	1966 (1)	1965
Sales and Earnings			
Net Sales	$413,083	430,409	376,838
Income before taxes	$ 40,747	48,762	43,335
Percentage of income before taxes to sales	9.9%	11.3%	11.5%
Income before extraordinary charges (2)	$ 24,715	29,307	25,655
Extraordinary charges	$(12,000)	—	—
Net income (2)	$ 12,715	29,307	25,655
Average number of common shares outstanding	10,855	10,596	10,239
Earnings per share of common stock: (2) (3)			
Income before extraordinary items	$ 2.28	2.77	2.51
Net income	$ 1.17	2.77	2.51
Dividends Paid			
Dividends per common share (3)	$ 1.50	1.25	1.25
Dividends on common stock (3)	$ 16,101	12,918	12,803
Dividends by acquired companies	$ 142	136	—
Financial Position			
Total assets (less applicable reserves)	$467,199	446,561	414,556
Working capital	$134,008	112,341	95,797
Gross property account	$482,567	458,440	438,788
Depreciation and accelerated amortization	$ 21,059	19,604	17,377
Long-term debt	$140,536	131,151	124,611
Stockholders' Equity			
Amount	$242,653	227,803	211,887
Common stock outstanding—shares	11,092	10,620	10,290
Per share	$ 21.88	21.45	20.59

(1) Financial and operating results of Temescal Metallurgical Corporation, Galleher, Inc., and Elastomers, Inc., are included for the years 1966 and 1967.

(2) Income before extraordinary charges, net income and the related per share data for the years 1960, 1962 and 1963 have been restated to reflect items previously reported as special items in retained earnings to conform with a recent pronouncement of the Accounting Principles Board of the American Institute of Certified Public Accountants.

(3) Earnings and dividends per common share are restated for comparative purposes giving effect to the 2-for-1 stock split, April 26, 1967.

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1964	1963	1962	1961	1960	1959	1958
338,884	306,377	287,398	257,896	257,228	254,724	217,598
31,725	32,618	32,205	29,404	37,270	39,729	32,094
9.4%	10.6%	11.2%	11.4%	14.5%	15.6%	14.7%
18,707	17,735	17,254	14,199	17,765	19,001	15,954
—	(3,097)	(3,030)	—	(2,265)	—	—
18,707	14,638	14,224	14,199	15,500	19,001	15,954
10,166	10,030	9,952	9,797	9,699	9,606	9,482
1.84	1.76	1.73	1.45	1.83	1.97	1.67
1.84	1.45	1.43	1.45	1.59	1.97	1.67
1.25	1.25	1.25	1.25	1.25	1.25	1.25
12,697	12,565	11,468	10,195	9,838	9,723	9,579
—	—	1,025	1,326	2,183	2,207	1,813
388,169	350,683	316,300	300,853	280,370	277,320	252,269
91,239	94,260	68,595	57,452	57,898	63,498	65,293
414,136	362,481	353,241	329,995	312,293	295,939	263,986
16,509	14,889	14,878	13,669	12,115	12,529	11,519
124,527	99,902	83,078	67,350	62,968	65,182	56,856
196,576	185,018	182,953	177,116	173,587	169,330	160,656
10,201	10,066	10,026	9,832	9,760	9,648	9,535
19.27	18.38	18.25	18.01	17.74	17.44	16.68

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SOURCE AND APPLICATION OF FUNDS

SOURCE OF FUNDS	1967	1966
From Operations		
Income Before Extraordinary Charge	$ 24,715,000	$ 29,307,000
Recovery from Depreciation	21,059,000	19,604,000
Deferred Income Taxes	5,835,000	5,248,000
Total from Operations	51,609,000	54,159,000
Proceeds from Bank Loans	21,875,000	7,877,000
Mortgage Financing	2,378,000	1,049,000
Sale of Stock to Officers and Employees	2,304,000	1,908,000
Other	826,000	3,765,000
Total	78,992,000	68,758,000
APPLICATION OF FUNDS		
Capital Expenditures	42,600,000	32,900,000
Dividends on Common Stock—Paid	16,243,000	13,054,000
Dividend Declared on Common Stock in December 1966, Paid in March 1967	3,882,000	3,882,000
Reduction in Long-Term Debt	2,364,000	2,917,000
Total	57,325,000	52,753,000
Increase in Net Working Capital During Period	21,667,000	16,005,000
Net Working Capital at Beginning of Period	112,341,000	96,336,000
Net Working Capital at End of Period	$134,008,000	$112,341,000

GENERAL COUNSEL	Shearman & Sterling, 20 Exchange Place, New York City
TRANSFER AGENT	First National City Bank, 55 Wall Street, New York City
REGISTRAR OF STOCK	Morgan Guaranty Trust Company of New York, 23 Wall Street, New York City
STOCK LISTING	New York Stock Exchange
TICKER SYMBOL	AN

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AIRCO BOARD OF DIRECTORS

	Director Since
*JOHN A. HILL Chairman of the Board	1947
*GEORGE S. DILLON President	1963
*CHARLES S. MUNSON Chairman of the Executive Committee	1929
RICHARD G. FOLSOM President, Rensselaer Polytechnic Institute	1960
*CLARENCE FRANCIS Industrialist; Retired Chairman of the Board, General Foods Corporation	1941
JOSEPH H. HUMBERSTONE Group Vice President	1963
ANDREW KAUL III President, Airco Speer Division	1961
*KEITH S. McHUGH Director of various corporations; formerly Commissioner of Commerce—State of New York	1944
CROCKER NEVIN President, Marine Midland Grace Trust Co. of New York	1967
*C. P. RATHER Director and Retired Chairman of the Board, Southern Natural Gas Co.	1966
*AVERY ROCKEFELLER Chairman, Schroder Rockefeller & Co., Inc.	1935
HUGH R. SMITH, JR. President, Airco Temescal Division	1967
*DOUGLAS B. STEIMLE Partner, Shearman & Sterling	1950
**KNIGHT WOOLLEY Partner, Brown Brothers Harriman & Co.	1934

*Executive Committee ★Audit Committee-1967

AIRCO CORPORATE OFFICERS

JOHN A. HILL,
Chairman of the Board
and Chief Executive Officer

GEORGE S. DILLON,
President
and Chief Operating Officer

JOSEPH H. HUMBERSTONE,
Group Vice President

ALFRED N. WOHLWEND,
Group Vice President

RICHARD V. GIORDANO,
Group Vice President

NORRIS B. McFARLANE,
Group Vice President

DAVID H. LYALL,
Vice President—Finance

DONALD REICH,
Vice President—Administration

DONALD B. BUSSEWITZ,
Assistant Vice President—Finance

HENRY M. KOSTER,
Treasurer

JOSEPH M. WALSH, JR.,
Secretary

ANTHONY J. ZACCARDI,
Controller

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[illegible] DIVISION

3801 Highland Avenue, Niagara Falls, N.Y. 14305
Telephone: (716) 285-1252
DONALD E. STINGEL, President
Products: alloy pig iron, ferrochromium, ferrochrome silicon, ferrosilicon, ferromanganese, silicomanganese, stainless steel pigs, special alloys & metals; calcium carbide & acetylene, quicklime & hydrated lime; coal & coke.
Major Markets: steel, automotive, foundries, aluminum, misc. metals; acid & waste neutralization, chemicals, coal mine drainwater treatment, highway construction, fluxing; electric power generation.
Plants: Calvert City, Ky. (2 plants); Charleston, S.C.; Louisville, Ky.; Niagara Falls, N.Y.

[illegible] PLASTICS DIVISION

150 East 42nd Street, New York, N.Y. 10017
Telephone: (212) 682-6700
ALFRED N. WOHLWEND, President
Products: vinyl acetate, polyvinyl acetate, polyvinyl alcohol, acetylenic alcohols & glycols, polyvinyl chloride resins; vinyl coated fabrics, molded vinyl plastics products, flexible plastic hose.
Major Markets: manufacturers of paint, paper, vinyl flooring, vinyl fabrics, phonograph records, adhesives, wire & cable extrusions, textiles, pharmaceuticals, perfumes, packaging materials; automotive upholstery, plastics fabricators, machinery & appliances, metal fabricators, furniture upholstery, swimming pool accessories.
Plants: Belleville, N.J.; Calvert City, Ky. (6 plants); City of Industry, Calif.; Cleveland, Ohio (2 plants); Costa Mesa, Calif.; Durant, Miss.; Elkton, Md.; Middlesex, N. J.; Morristown, [illegible] Parsippany, N.J.; Sandusky, Ohio.

[illegible]

1900 Lane Road, Irvine, Calif. 92664
Telephone: (714) 540-3010
PAUL P. DURON, President
Products: equipment for processing, storing & transporting liquefied gases; advanced cryogenic units such as high pressure pumps, vaporizers, high frequency electrical motors & alternators, closed cycle refrigerators, integrated systems.
Major Markets: cryogenic liquid producers, aerospace, research laboratories, petrochemical industry.
Plant: Irvine, Calif.

[illegible] GAS DIVISION

150 East 42nd Street, New York, N.Y. 10017
Telephone: (212) 682-6700
DONALD C. GILES, President
Products: oxygen, nitrogen, acetylene, carbon dioxide, argon, hydrogen, helium & the rare gases (krypton, neon & xenon), cryogenic fluids & related equipment.
Major Markets: iron & steel, chemical, foods & beverages, federal government, electronics & electrical equipment, machinery, aerospace, metal fabricating, automotive.
Plants—Tonnage Industrial Gas and Cryogenic Fluid: Albion, Mich.; Arroyo, W. Va.; Beaumont, Texas; Bethlehem, Pa.; Buffalo, N.Y.; Butler, Pa.; Chicago, Ill.; City of Industry, Calif.; Claymont, Del.; East Alton, Ill.; Fairfield, Ala.; Huron, Ohio; Johnstown, Pa.; Lorain, Ohio; New Orleans, La.; Phoenix, Ariz.; Richmond, Calif.; Riverton, N. J.; South Acton, Mass.; Tampa, Fla.; Vancouver, Wash.; Warren, Ohio.
Plants—Carbon Dioxide: Berkeley, Calif.; Chicago, Ill.; Deepwater, N. J.; Kansas City, Kan.; Niagara Falls, N.Y.
Other Plants: 6 small industrial gas plants; 27 small acetylene generating plants; 6 hydrogen plants; 1 liquid hydrogen facility at Pedricktown, N. J.; liquid helium conversion plants at Chicago, Ill., Riverton, N. J., and South Acton, Mass.; rare gases plant at Riverton, N. J.

AIRCO SPEER DIVISION

800 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2801
ANDREW KAUL III, President
Products: threaded graphite electrodes, electrolytic anodes, motor & generator brushes, carbon welding & gouging rods, carbon battery electrodes, carbon & graphite molds & fixtures & specialties; fixed composition resistors & capacitors, metal film resistors, coil forms & radio frequency choke coils, cermet pastes.
Major Markets: steel, foundry, electrochemical, aluminum, quartz, refractories, automotive, railway, aircraft, federal government, dry cell battery manufacturers; TV & radio, electronic data processing equipment, industrial instruments, military electronic apparatus.
Plants: Bradford, Pa.; DuBois, Pa.; Niagara Falls, N.Y.; Punxsutawney, Pa.; St. Marys, Pa.

[illegible] DIVISION

2850 Seventh Street, Berkeley, Calif. 94710
Telephone: (415) 841-5720
HUGH R. SMITH, JR., President
Products: integrated high-vacuum electron-beam systems, vacuum induction furnaces, high-vacuum valves & pumps, power supplies, electron-beam guns & related monitoring equipment & instrumentation, transformers & processing of special materials in electron-beam furnaces.
Major Markets: electronics & electrical equipment; optical; steel, nuclear & other industries using high temperature materials; federal government.
Plant: Berkeley, Calif.

[illegible] PRODUCTS DIVISION

150 East 42nd Street, New York, N.Y. 10017
Telephone: (212) 682-6700
LAWRENCE W. KUNKLER, President
Products: oxyacetylene, arc welding & inert gas-shielded arc welding & cutting equipment, electrodes & wires; Jackson arc welding accessories & safety equipment; cylinder gases.
Major Markets: machinery & appliances, railroad & shipbuilding, metal fabricating, automotive, iron & steel, electrical equipment & electronics, aircraft & aerospace, federal government.
Plants: Arroyo, W. Va.; Cleveland, Ohio; Sparrows Point, Md.; Union, N. J.; Warren, Mich.; Antwerp, Belgium.

[illegible]

1400 East Washington Ave., Madison, Wis. 53701
Telephone: (608) 256-5421
WILLIAM A. LUNGER, President
Products: anesthetic agents; medical gases; anesthetic, inhalation therapy & resuscitation equipment; cryosurgery equipment; hospital piping systems; infant incubators; respirators.
Major Markets: hospitals, clinics & nursing homes; medical & dental professions; fillers of pressurized propellant products.
Plants: Berkeley, Calif.; Cleveland, Ohio; Fort Myers, Fla.; Lodi, N. J.; Madison, Wis.

CANADIAN SUBSIDIARIES

[illegible] LIMITED

905 Hodge Street, St. Laurent, Montreal 9, Quebec
Telephone: (514) 744-4931
STEPHEN H. NEWBURN, President
Products: arc welding electrodes & wires, welding & cutting equipment, carbon dioxide, argon & helium, Jackson arc welding accessories & safety equipment; Stoody products; hospital equipment & medical gases.
Plants: Montreal, Quebec and Toronto, Ontario

[illegible] COMPONENTS LIMITED

19 Hafis Road, Toronto 15, Ontario
Telephone: (416) 241-4491
ARNOLD SIMONI, President
Products: low power, semi-precision variable resistors & trimmer potentiometers.
Plant: Toronto, Ontario

SPEER CARBON COMPANY OF CANADA LIMITED

3200 Sartelon St., St. Laurent, Montreal 9, Quebec
Telephone: (514) 332-9302
RONALD SPAFFORD, General Manager
Products: motor & generator brushes, carbon gouging rods & specialties.
Plant: Montreal, Quebec.

Printed In U.S.A.

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Annual Report to Stockholders for the Year Nineteen Seventy

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HIGHLIGHTS	1970	1969	Percent Change
Sales[1]	$436,501,000	$433,665,000	+ 0.7%
Depreciation[1]	25,350,000	23,848,000	+ 6.3%
Income Before Taxes[1]	31,900,000	31,911,000	–
Income From Continuing Operations[2]	18,295,000	20,148,000	– 9.2%
Income Per Share From Continuing Operations[2]	1.60	1.78	–10.1%
Dividends Paid Per Share	.80	1.15	–30.4%
Book Value Per Share	22.23	22.58	– 1.6%
Facility Additions			
Capital Expenditures	49,900,000	55,300,000	– 9.8%
Leased Facilities	2,000,000	5,100,000	–60.8%
Total Assets (less applicable reserves)	564,583,000	550,210,000	+ 2.6%
Stockholders' Equity	255,747,000	256,222,000	– 0.2%
Shares of Common Stock Outstanding at End of Year	11,503,582	11,348,324	+ 1.4%
Number of Stockholders at End of Year	50,783	50,669	+ 0.2%
Number of Employees at End of Year[1]	12,709	12,797	– 0.7%

1. *Continuing Operations*
2. *Computed before extraordinary charge to income and loss from discontinued operations of $11,801,000 or $1.03 per share in 1970 and before income from discontinued operations of $178,000 or $.02 per share in 1969.*

Air Reduction Company, Incorporated

Executive Offices: 150 East Forty-Second Street, New York, New York 10017
Telephone: (212) 682-6700

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ANNUAL MEETING APRIL 28, 1971

Airco stockholders are cordially invited to attend the 1971 Annual Meeting at 10 A.M. on Wednesday, April 28, 1971. The meeting will be held in the Windsor Suite on the lobby floor of the Hotel Commodore, 100 East 42nd Street, New York City. Formal notices of the Annual Meeting, Proxies and Proxy Statements will be mailed on or about March 29, 1971.

CORPORATE DATA

GENERAL COUNSEL
Shearman & Sterling
53 Wall Street,
New York, N.Y. 10005

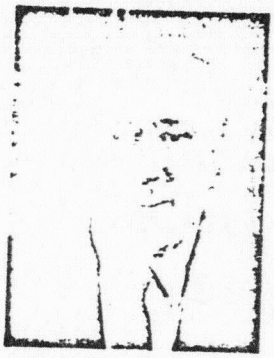
AUDITORS
Haskins & Sells
New York, N.Y. 10004

TRANSFER AGENT
First National City Bank
111 Wall Street,
New York, N.Y. 10005

REGISTRAR OF STOCK
Company of New York
23 Wall Street,
New York, N.Y. 10005

STOCK LISTING:
New York Stock Exchange

TICKER SYMBOL: AN



As outlined in Airco's special Fourth Quarter Letter to Stockholders, we sold our chemicals and plastics business, certain property and equipment related primarily to our Canadian filler metals business, and we discontinued certain electronic product lines during 1970. These actions resulted in an extraordinary charge of $10.5 million net of related tax benefits.

1970 Sales and Earnings Accordingly, we have recast both our 1969 and 1970 sales and earnings to reflect our continuing operations. On this basis, sales for 1970 were $436.5 million, up slightly over 1969 sales of $433.7 million.

1970 earnings from continuing operations were $18.3 million after taxes, a drop of nine per cent under 1969 earnings of $20.1 million. These earnings per share in 1970 were $1.60 versus $1.78 per share for 1969.

In comparing 1969 and 1970 earnings from continuing operations, it should be noted that 1970 earnings were affected adversely by two major factors not related directly to operations, a reduction in the company's investment tax credit (18 cents per share) and higher interest rates (6 cents per share).

As also noted in the Fourth Quarter Letter, the 1970 earnings from continuing operations exclude the extraordinary charge of $10.5 million, or 92 cents per share, and a loss of 11 cents per share from discontinued businesses.

Airco's Chemicals and Plastics Business Sold On January 28, 1971, we sold our chemicals and plastics business to Air Products and Chemicals, Inc., and as a result, we will receive approximately $30 million in cash, of which about $17 million will be paid within one year and the balance over an eight-year period.

The money realized on the sale of our chemicals and plastics business will be utilized to expand our other product groups, which are returning higher profit margins, and to develop new businesses based on advanced technology in which the future profitability appears excellent.

Division and Product Group Performances The 1970 performance by each of Airco's 10 divisions is outlined in the "Division Performance Reviews" section (pages 4 to 19) of this Report. The 1969-1970 sales and earnings contributions of our five major product groups are detailed on page 24.

Bank Refinancing Completed On November 20, 1970, the company entered into a loan agreement with a group of 13 banks, providing for advances to Airco of up to $75 million during the period ending December 31, 1972. The interest rate is ¼% above the prime rate until December 31, 1972, and thereafter ½% above the prime rate. The amount owed by the company at that date is repayable thereafter in ten equal semi-annual installments beginning June 30, 1973. On November 20, 1970, the company took down $64.5 million. Of this amount, $52.5 million was used to retire loans under the previous agreement, and the remaining $12 million to provide working capital.

Outlook for 1971 We believe that in 1970 we made good progress in the face of a domestic economy that was weak generally, and particularly weak in our largest market, the basic steel industry. We are anticipating that in 1971 the economy will move upward slowly from the 1970 doldrums. We expect the movement to be erratic, with some distortion in the first half caused by a recovery from the automotive strike and steel stockpiling, and in the second half caused by a lull following negotiation of a new steel contract or a steel strike. In this economic environment, it will be essential that we exert ourselves to the utmost in order to improve our profitability. We are making such an effort, and we believe we will succeed.

Once again, we wish to express our appreciation to our employees, stockholders, distributors and customers for their support and encouragement.

George S. Dillon

GEORGE S. DILLON
President

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Airco and the Environment

THE ENVIRONMENTAL PROBLEM

In 1900, less than 80 million people lived in the United States. Today, in essentially the same space, over 200 million persons live, and each of them is creating far more pollution and waste than his or her counterpart at the start of this century.

By 1980, less than nine years away, our country's population will reach an estimated 230 million persons, and our gross national product will have more than doubled—from $977 billion in 1970 to an estimated $2 trillion in 1980! It taxes the imagination to visualize what this 15% increase in population and over 100% increase in economic activity will mean in waste disposal problems.

This environmental problem is not being caused by industry alone. In fact, several reputable studies show that less than one-third of the principal atmospheric pollutants in the U.S. results from manufacturing plants or electric-generating complexes. Two-thirds comes from other sources, mostly automobiles and municipalities. Industry is not the major contributor to water pollution either; it is woefully inadequate municipal sewage systems.

THE OVERALL SOLUTION

All of us—industry, government and the general public—must quickly face up to the urgent necessity of restoring and preserving our priceless and irreplaceable natural resources.

The estimated costs of achieving a relatively pollution-free environment are staggering—perhaps as much as $200 billion over the next 30 years—to clean the air and water and to dispose of vast mountains of solid waste.

All of us are going to have to pay the bill for pollution abatement and control equipment, through higher taxes, increased fuel and electric power costs and in higher prices for the products we buy and sell.

We hope the Federal Government and the states and municipalities will agree soon on policies, priorities and standards of environmental quality and, in doing so, resolve the great many contradictory local, state and national laws in force or [illegible] assure. Once this constructive step is taken, we believe the interpretation and enforcement of controls should be up to regional or [illegible] costs.

It is going to be a long and a difficult task, but it can be accomplished if we all act responsibly and with a sense of urgent concern.

As a responsible and responsive corporate citizen, we intend to do everything that one company reasonably can do to improve the quality of our overall environment.

We recognize we have a dual responsibility: we must operate our business in a way that will insure its ability to grow and to provide its stockholders with an adequate return on their investment. At the same time, we must operate in a manner that is consistent with a clean, wholesome and attractive environment for our employees and other persons living in those many communities in which we operate facilities.

Current [illegible] **Like** many other major U.S. corporations, we have made notable progress in many areas of our operations, but we still have a long and expensive road to travel. Our principal problem is air pollution, resulting almost entirely from our alloys, carbide and graphite manufacturing operations.

[illegible] **In the past three years alone, Airco has spent or appropriated over $33 million to eliminate air and water pollution problems. For example:**

New Carbide Furnace in Louisville, Ky. In 1969, we completed a new 50,000-kilowatt covered electric furnace, which cost $6.9 million. This unit was built because the carbide particulate matter from the seven older furnaces represented a major air pollution problem. We plan to spend additional sums in 1971-72 to solve our air pollution problems there.

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New Alloy Furnaces in Charleston, S.C. We are spending $17 million for two new hooded electric furnaces to replace five older furnaces, which were major sources of air pollution. One of these furnaces was completed in 1970, the second will be finished in mid-1971, and both will be in full compliance with air and water pollution regulations.

New Baghouse for Niagara Falls Alloys Plant We are installing a $3.7 million baghouse filter system to practically eliminate all particulate matter from the air.

New Alloys Furnace in Sweden Airco Alloys AB is now building and will complete in mid-1972 a new 40,000-kilowatt furnace in Vargon, Sweden. This new furnace will cost $8 million. About $5 million of this amount is being spent to replace current facilities which, though economic, cause pollution problems we are unable to solve with existing equipment. This furnace, when completed, will include the latest anti-pollution devices required to meet Sweden's environmental regulations.

Two Speer Graphite Plants Feature New Control Equipment As part of a three-year expansion program just completed, Speer's graphite plants at Niagara Falls, New York, and St. Marys, Pennsylvania, include over $1 million for pollution control equipment.

New Berkeley Steel Refining Plant Is Pollution-Free Airco's new Vacuum Metals plant in Berkeley, California, produces high-purity stainless steel using a pollution-free production process involving an electron-beam energy source sealed inside a high-vacuum chamber.

Future Airco Programs Substantial additional expenditures will be required. For example, we are placing a top priority on a carefully planned program to bring our Calvert City, Kentucky Alloys and Carbide facilities into compliance with air and water pollution regulations. As currently envisioned, this five-year program, starting in 1971, could cost $35 million.

It also is our policy to include fully adequate pollution-abatement equipment as an essential component of any new plants.

The installation of pollution-abatement equipment is extremely costly and does not provide any return on the sizeable investment required. Additionally, this equipment increases operating costs. For these reasons we do not believe the installation of such facilities should be penalized by sales or personal property taxes. We hope also that the Federal Government will encourage environmental control programs by providing more effective tax incentives. The present Federal income tax incentive is hopelessly inadequate because it does not cover the installation of new pollution-free facilities, built solely to replace existing facilities, otherwise economic, that cause major pollution problems.

In addition to the extensive programs completed and under way to clean up our own pollution problems, we also are engaged in promising research projects to assist both ourselves and others to solve pollution problems. We believe these solutions may present us with some good business opportunities.

For instance, we have developed a tertiary ozone process that renders sewage effluent odorless and colorless—actually pure enough to drink. We're now operating a pilot plant in Washington, D.C., under a contract from the Environmental Protection Agency, to develop data on the economics of large-scale operation.

Also into pilot-scale testing is a new water pollution control process using oxygen for secondary treatment of liquid waste. A portable pilot plant has proven successful at several locations for municipal sewage and at one industrial location. In all cases, our process is an appreciable improvement over systems presently in use.

We recognize that bringing all of our operating facilities into full compliance with environmental control laws will be very costly, and that it will require a good deal of realistic understanding and cooperation from all of us who are involved and who share a common concern and commitment to restore and maintain our irreplaceable natural resources.

Overall, it is a monumental undertaking for industry, for our government and for all of us as individuals, but it must be done!

GEORGE S. DILLON

Ex-175-B

A 4561

Sales dipped 6% but alloys earnings moved upward as prices improved and international operations hit new highs

Earnings from ferroalloy operations set an all-time high, even though sales of the Airco Alloys and Carbide Division were down about six per cent in 1970. A firm domestic price structure in chrome, manganese and silicon alloys and considerably higher sales to overseas users were the major contributors to the division's excellent performance.

New Charleston furnace started production The first of two 35,000-kilowatt ferroalloy furnaces was completed in mid-1970 at Charleston, South Carolina. The second furnace is scheduled for completion in mid-1971, and total investment in furnace facilities at the Charleston location will be $17 million.

Mobile facility acquired Last November, the division acquired, for $8.5 million, a one-year-old 40,000-kilowatt furnace and metals processing complex located on a 400-acre site in Mobile, Alabama. The furnace went on-stream early in January, 1971. Like the Charleston facility, the Mobile plant's access to the sea offers significant importing and exporting advantages.

International sales grew; expansion under way in Sweden During 1970, worldwide sales, particularly in Europe and Japan, advanced substantially. To meet this growing demand for Airco's ferroalloys, and to replace several old furnaces, a new 40,000-kilowatt furnace is currently being installed at the company's subsidiary, Airco Alloys AB, in Vargon, Sweden. Completion is set for the first half of 1972.

Carbide sales uptrend; earnings off slightly The division's carbide operations modestly improved sales in 1970, but earnings declined slightly because of sharply increased costs for power and raw materials.

Products: *Alloy pig iron, ferrochromium, ferrochrome silicon, ferrosilicon, ferromanganese, silicomanganese, stainless steel pigs, special alloys and metals, calcium carbide and acetylene, quicklime and hydrated lime.*

Plants: *Calvert City, Ky. (2); Charleston, S. C.; Louisville, Ky.; Mobile, Ala.; Niagara Falls, N. Y.; Wengern, West Germany; Vargon, Sweden (Airco Alloys AB).*

Alloy Markets: *Steel, automotive, foundries, aluminum, miscellaneous metals.*

Carbide Markets: *Chemical, welding and cutting, construction, waste and mine drain-water treatment.*

Top: *Theodore E. Dar President, Airco Alloys a Carbide, stands before the c pollution control equipme section of the new Charleste South Carolina fer furnace facilit*
Center left: *An overall twilig view of the Charlest installation; the furnace housed in the high structu at the rig*
Bottom left: *Harold Mercer, Senior Vice Presid International (left), and S. Tjernstrom, Managing Dir tor, Airco Alloys AB, stu sketch and survey the open furnace at the Vargon, S facility. Bottom right: furnace building o Mobile, Alabama metals pr essing installation nearl late in 1970; the plant sta producing ferrosilicon beginning of this ye*

A 4562

EX-175-11

A 4563

Completion of expansion program reflected in new records, both in sales, up 16%, and in earnings

The Airco Speer Carbon-Graphite Division entered 1970 having essentially completed a three-year (1966-1969), $35 million expansion program at its major production facilities in St. Marys, Pennsylvania and Niagara Falls, New York. This increased capacity and production efficiency enabled the division to more effectively meet the ever-growing demand for high-performance graphite electrodes by the expanding electric steelmaking industry.

Sales advanced some 16 per cent above record 1969 levels, and earnings showed a substantial improvement in establishing new highs. These outstanding results were achieved even though sales for the first quarter of 1970 were penalized as a result of low inventories caused by a four-and-one-half-month strike at the St. Marys plant in the second half of 1969.

Overseas sales higher in 1970 Increased production capacity permitted the division to launch an aggressive marketing program internationally, with the result that overseas sales made a larger contribution to profitability than in any previous year. Shipments of graphite electrodes were made to India, Great Britain, West Germany and South Africa.

Demand strong for division's broad line Although a major portion of Airco Speer's sales increase in 1970 came from graphite electrodes, the division also maintained a strong sales position in many other product lines, including graphite anodes for producing chemicals and magnesium, carbon brushes used in diesel locomotive motors, Kostkutter gouging rods for cleaning steel castings, electrodes for electrical discharge machining, and machined graphite specialties.

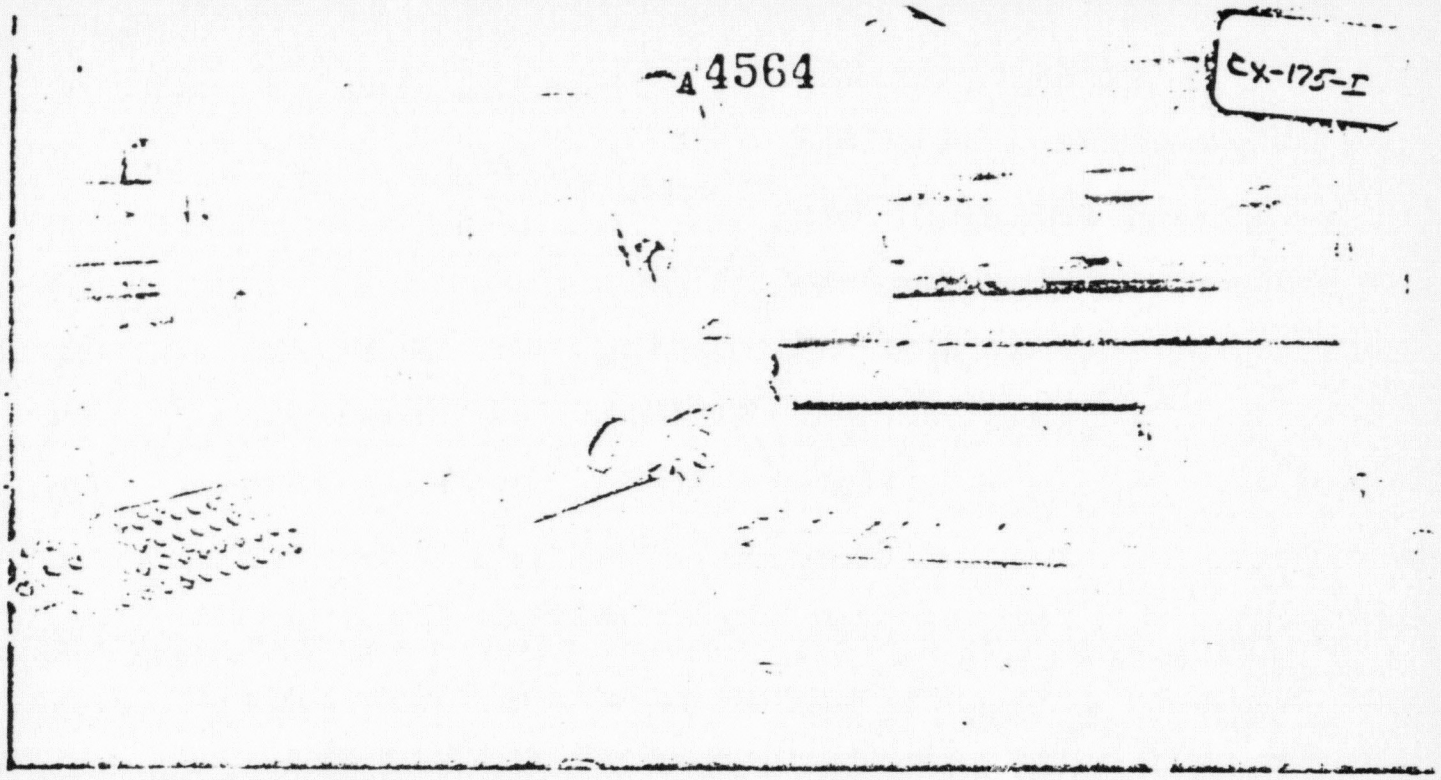
Products: *Threaded graphite electrodes for steelmaking; anodes for electrolytic production of chemicals and metals; brushes for motors and generators; electrodes for electrical discharge machining; graphite welding and gouging rods; carbon battery electrodes; machined carbon and graphite molds, fixtures and specialties.*

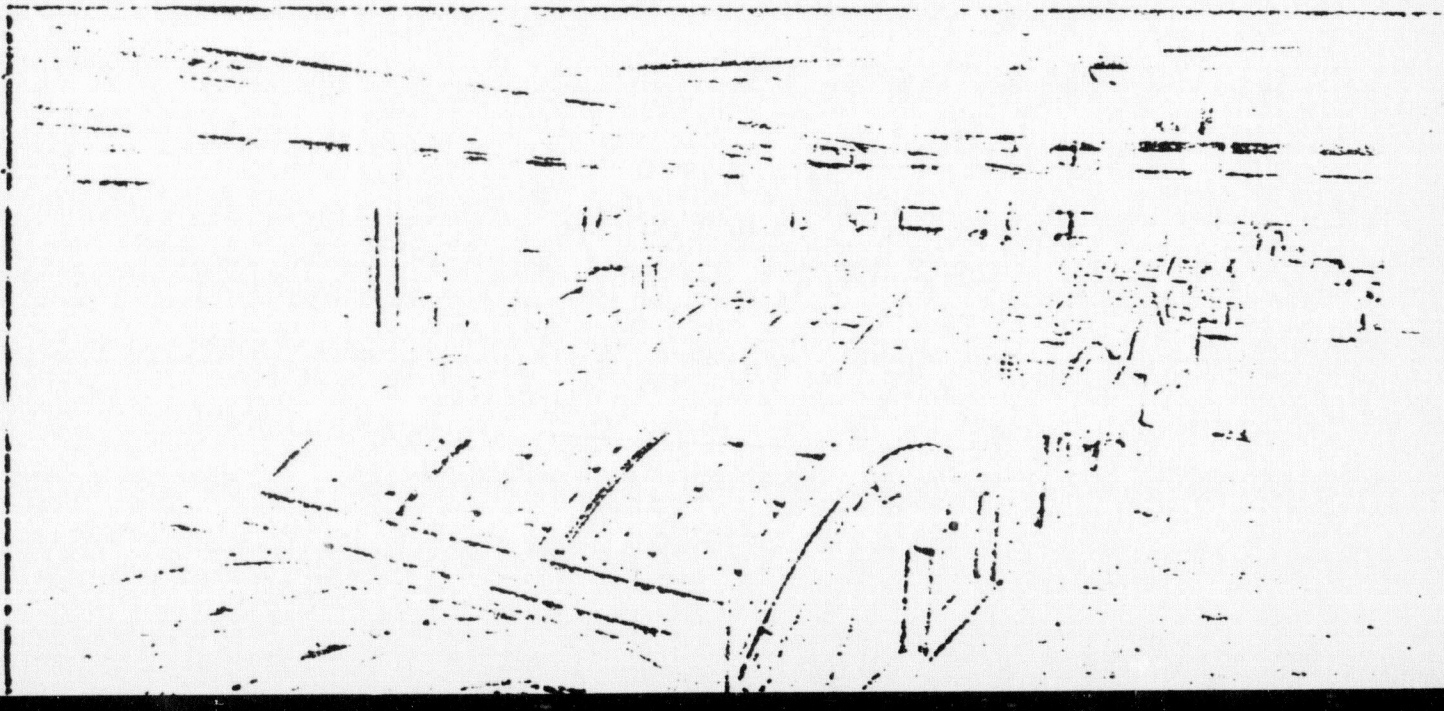
Plants: *Niagara Falls, N. Y.; Punxsutawney, Pa.; St. Marys, Pa.; Montreal, Canada (Speer Carbon Co. of Canada Ltd.).*

Markets: *Steel, foundry, electrochemical, nonferrous metals, quartz, refractories, automotive, railway, aircraft and aerospace, manufacturers of dry cell batteries, Federal Government.*

Top: *Thomas H. W... President, Airco S... Carbon-Graphite, at cont... panel of automatic electr... threading machine in ... graphite finishing p... Niagara Falls, New Yo...* **Center:** *Aerial view of ca... products and gra... electrode plants, St. M... Pennsylvania. Wi... buildings and large ... story plants at left ar... new manufacturing fac... completed during the ... three years.* **Bottom:** *Int... of carbon baking fac... built in 1969 at St. Ma...*

CX-175-I





Ex-175-T

Sales up 28%, but earnings dropped as economy sagged

Sales of the Airco Temescal Division's vacuum equipment and electronic coating equipment increased 28 per cent, principally during the first half, but were well below forecasted levels for 1970. The downturn in the economy caused a precipitous drop in sales volume during the second half and a loss for the year. Significant cutbacks in administrative and other expenses during the third and fourth quarters minimized the impact of the sudden reduction in sales volume.

Overseas sales improved Far East sales in 1970 were markedly increased through the division's sales agent in Japan. European sales are also expected to advance sharply as a newly formed subsidiary in the Netherlands becomes effectively established in 1971.

Installation completed for coating jet engine parts Longer life and greater fuel-burning efficiency are two major advantages resulting from the division's newly developed equipment for coating jet engine blades and vanes. This totally unique equipment will contribute substantially to 1971 profits.

Products: *Integrated high-vacuum electron-beam (EB) systems and components, vacuum induction furnaces, high-vacuum valves and pumps, power supplies, EB guns and related monitoring equipment, transformers, processing of special materials in EB furnaces.*

Plant: *Berkeley, Calif.; and a warehouse in Amsterdam (Airco Temescal N. V.).*

Markets: *Steel, alloys, electronics, optical, aircraft, glass, Federal Government.*

Left: *Hugh R. Smith, Jr. President, Airco Temescal, in front of a recently constructed electronic components coating in the Berkeley, California plant.* **Right:** *For electron-beam control panel being inspected by Donald F. Baker.* **Bottom:** *Airco Temescal's CV 10 power supplies being assembled by (left to right) Merle S. Knight, Fahridin Nushi, Peter W. Fong Leong and Robert E. Rhode*

Performance penalized by start-up delays; expect marked improvement in 1971 results

Production and sales from the Airco Vacuum Metals Division's new Electron Beam Hearth Refining (EBHR) facility in Berkeley, California, were sharply curtailed because of start-up delays. Nevertheless, substantial tonnage quantities of E-Brite 26-1, the revolutionary new stainless steel produced by the EBHR process, were shipped to many domestic producers, who successfully converted the extremely pure metal into a variety of mill product forms. Keen interest also was shown by several major foreign steel producers.

First product, E-Brite 26-1, widely accepted Because E-Brite 26-1 has superior corrosion resistance in the most severe environments, it is expected to gain wide use by the chemical process industry. Large-volume applications are also indicated in the petroleum refining, power and food processing industries.

Products: *Electron-beam hearth refined stainless and special steel products in the form of cast slabs and blooms.*

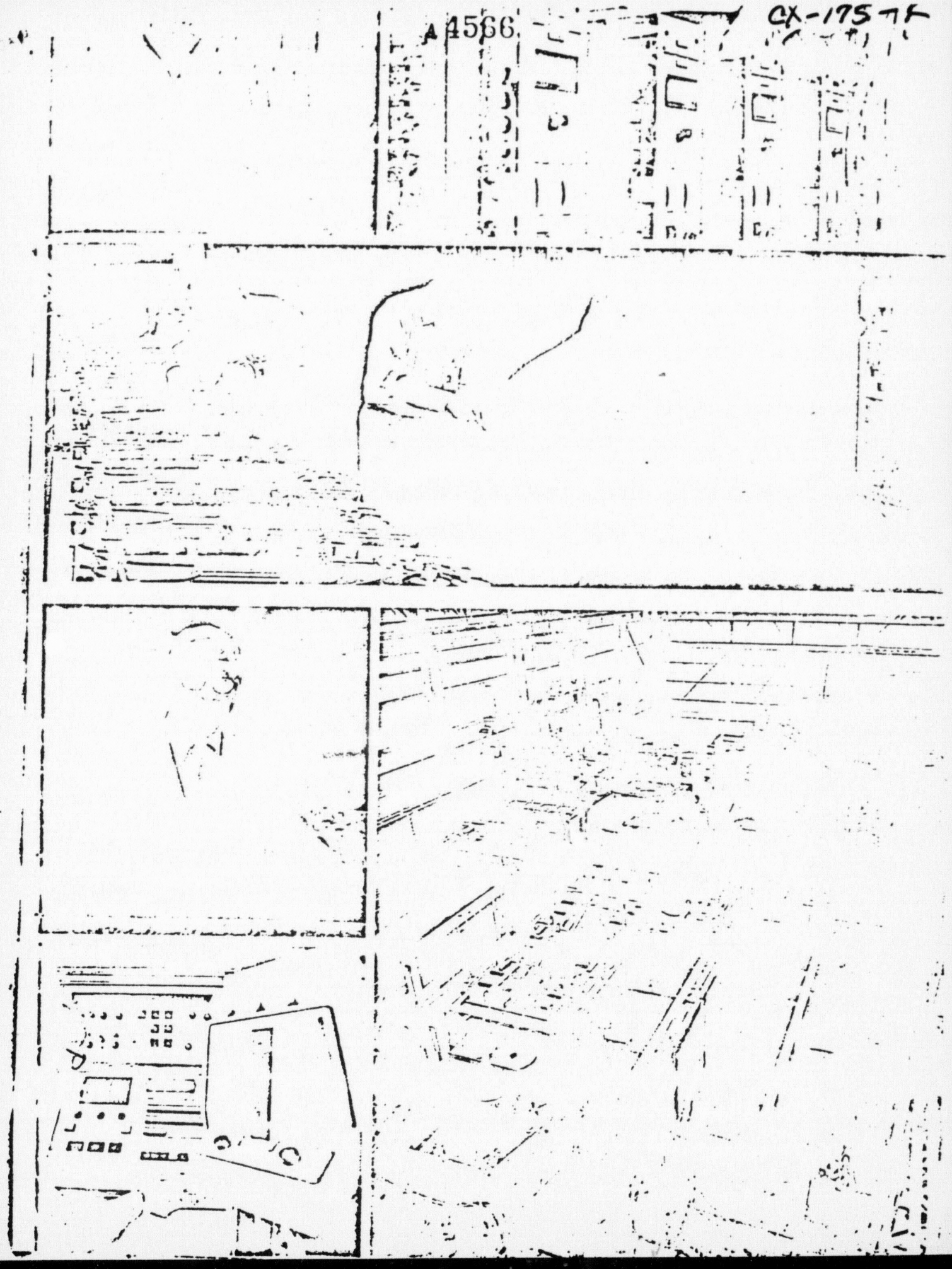
Plant: *Berkeley, Calif.*

Markets: *Chemical process, petroleum refining, pulp and paper, power, desalination and water treatment, shipbuilding and marine, food processing.*

Left: *John P. Stren President, Airco Vacuum Metals, between rows of E-Brite 26-1 slabs in the shipping area of the Berkeley, California plant. New met won national competition one of the 100 most signific industrial products of* **Bottom left:** *Computer and control equipment, operated by Michael E. Mercer, used conduct tests of E-Brite 26 at various production stage* **Right:** *Bird's-eye view of the EBHR furnace installation Berkeley, California*

A4566

CX-175-F



CX-175-L

A 4567

Sales climbed 18% to set new highs in sales and earnings

In setting record performance marks during 1970, the Airco Viking Division substantially increased its sales of turbine engine rings and added overseas customers for its high-temperature ring mill products and extrusion forgings.

Modern Nevada plant operated at top capacity The three-year-old plant in Verdi, Nevada, performed at maximum efficiency in producing a wide range of engineered ring components for gas turbine engines, particularly titanium rings for the huge engines designed to power the 747 jet airliners.

Sales grew in industries other than aircraft In addition to being an important supplier to the aircraft industry, Airco Viking increased its output of rings and extrusions for the electronics industry; large hooks, blocks and sheaves for the steel industry; and rings and forgings for the materials handling, machinery and petrochemical industries.

Products: *Seamless roll forged rings, press and hammer forgings, crane mill parts, custom rolled bar—produced in titanium, nickel base and refractory alloys, stainless steels, aluminum, alloy steels and copper alloys.*

Plants: *Albany, Calif.; Verdi, Nev.*

Markets: *Gas turbine, aerospace, machinery, electronics, petrochemical, nuclear.*

Left: *M. Victor W... President, Airco V... inspects titanium r... quality control sector o... Nevada plant.* **Right:** *truck operator Cla... Trivett removes titaniu... from a furnace; ingot... converted into the ring... in the photo b...* **Bottom right:** *James C. ... (left), washes off scale... nine-foot titanium... James P. Leitzow mo... the controls of a r...*

AIRCO SPEER ELECTRONICS DIVISION

Sales off 13%; earnings depressed by sharp drop in sales of radio and TV sets and by strong foreign competition

The substantial decline in the manufacture of home entertainment products and the accelerating impact of lower-priced foreign imports were the main reasons for the unfavorable performance of the Airco Speer Electronics Division in 1970. Sales were further reduced by phasing out two product lines that did not offer long-term profitability. In addition, start-up expenses at the new facilities in Singapore and Nogales, Mexico had a negative effect on earnings.

Singapore and Nogales plants strengthen competitive position The 100,000-square-foot electronic resistor plant in Singapore has been in production since the first quarter of 1970, and the significantly lower manufacturing costs at this large, modern facility are greatly improving the division's future competitive stance. A smaller, economical electronic inductor facility, located in Nogales, Mexico, also started producing volume quantities during the past year.

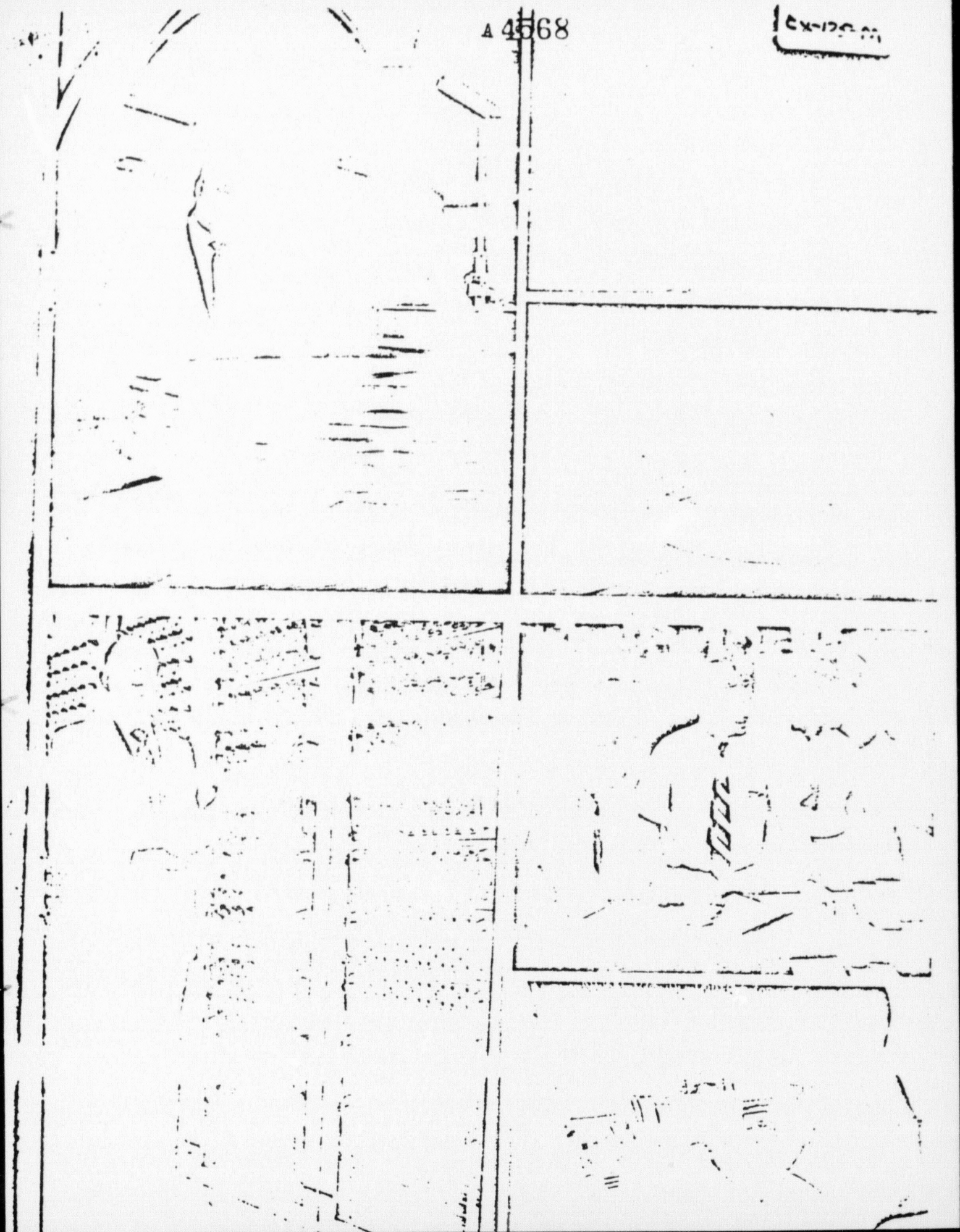
Products: *Fixed composition resistors and capacitors, radio frequency choke coils, ...*

Plants: *Bradford, Pa.; Nogales, Mexico (Airco de Mexico S. A. de C. V.); Singapore (Airco Singapore Pte., Ltd.).*

Markets: *TV and radio, electronic data processing equipment, industrial instruments, military electronic apparatus.*

Left: *Lawrence M. Li... President, Airco S... Electronics, studies res... after completion of accel... life-tests in quality co... laboratory, Bra... Pennsylvania.* **Right:** *... up production ve... the new Singapore ... Tom C. ... Manager (left), and S... Foster, General M...* **Bottom right:** *L... Alcantar Mendo... tes... frequency choke coi... Nogales, Mexic...*

Ex-1250-M



EX-175-N

A 4569

Sales declined 3%, but aggressive cost-cutting program and more stable pricing substantially improved profits

Even though sales were about three per cent lower than 1969, major cost-reduction programs at all operating levels, combined with a general strengthening of selling prices, achieved greatly improved earnings for the Airco Industrial Gases Division in 1970.

Two oxygen plants being built for U.S. Steel Last December, the division received a contract from U.S. Steel for the construction of two 400-ton-per-day gaseous oxygen plants at the Fairless Works in Pennsylvania. Scheduled for completion early in 1972, the plants are being built by Airco/BOC Cryogenic Plants Corp., a 50-50 joint venture of Airco and British Oxygen Co.

New refrigeration system developed for mammoth jets The division developed and introduced a new carbon dioxide food refrigeration system, called Airco Sky-Cold, for the new generation of widebodied jet aircraft. Developed in conjunction with Sky Chefs, Inc., a catering subsidiary of American Airlines, the system employs high-density pellets of carbon dioxide (dry ice) as the refrigerant. Sky-Cold systems have been installed at nine airports in the United States, and will be installed in the near future at several major European airports.

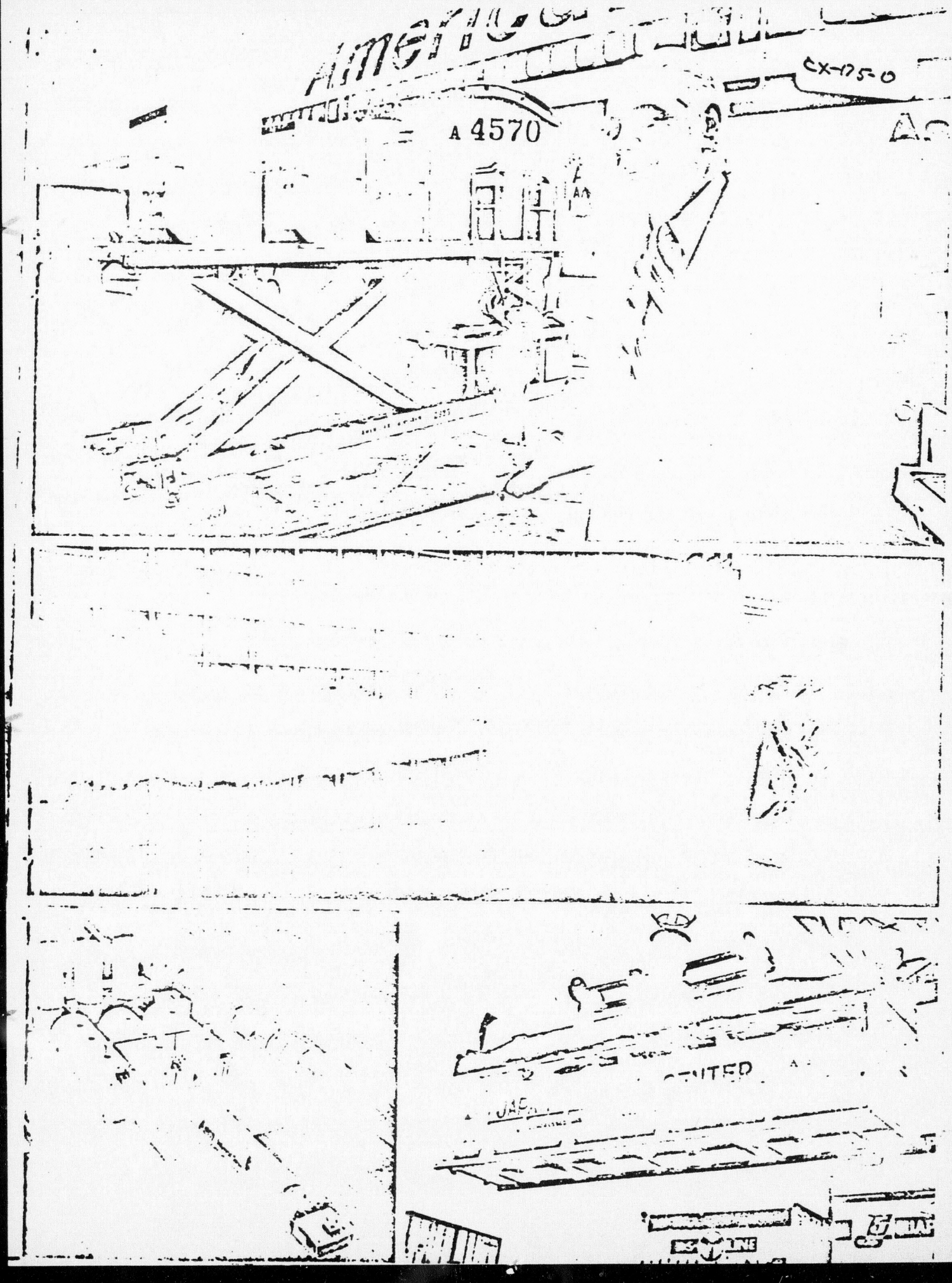
Liquid helium joint venture formed in Japan Late in 1970, Airco Industrial Gases and Nippon Sanso, K.K., Tokyo, Japan, formed the K.K. Japan Helium Center to sell and distribute helium in Japan. The Japanese helium market is currently growing at the rate of 25 per cent a year. Airco delivers liquid helium, via ocean container ship, to the Center in specially insulated 8,500-gallon containers.

Products: *Oxygen, nitrogen, argon, hydrogen, helium, carbon dioxide, and the rare gases (krypton, neon and xenon), cryogenic fluids and related equipment.*

Plants: *Fifteen on-site industrial gas and cryogenic fluid, two carbon dioxide, one liquid hydrogen, one rare gases, one gaseous hydrogen and four liquid helium conversion plants; helium transfilling plant in Antwerp, Belgium (N. V. Airco Continental S. A.).*

Markets: *Iron and steel, nonferrous metals, chemical, food and beverage, electronics and electrical equipment, machinery, aerospace, metal fabricating, automotive, anti-pollution, Federal Government.*

Top: *Charles H. Simpson, President, Airco Industrial Gases, visits Kennedy International Airport, New York City, to witness Sky-Cold frozen modules being loaded aboard a 747 jet.* **Center:** *Thomas Brown firing an oxy-fuel burner at the division's test site in Chester, West Virginia. The Airco-developed oxy-fuel process is finding wide use by metals and glass industries to supplement conventional combustion methods.* **Bottom left:** *Overhead view of liquid oxygen station at U.S. Steel's Fairless Works. Installation supplies oxygen to steelmaking furnaces on interim basis until Airco facility completes construction of two new 400-ton-per-day plants at that location.* **Bottom right:** *A shipment of liquid helium being unloaded from container ship. Tests for truck delivery to newly formed K.K. Japan Helium Center, Kawasaki City.*


CX-175-0
A 4570

CX-175-F

A 4571

Sales increased 30%, and earnings reached new highs; promising new products played major role in success

Wide customer acceptance for new precision-engineered food freezing and liquefied natural gas (LNG) equipment, designed and constructed by the Airco Cryogenics Division, set the pace for the highest sales and earnings in the division's history.

Major contracts received for food freezing units During 1970, several contracts, totalling more than $3 million, were received for the division's °KwikFreeze food freezing systems. This high-speed, production-line equipment utilizes either carbon dioxide or liquid nitrogen in the quick freezing of meat, bakery products, poultry and seafood.

LNG market growth continued Liquefied natural gas equipment—including turboexpanders, turbocompressors, centrifugal pumps and huge 50-foot liquefaction columns—made an important contribution to the division's excellent performance. These units are used in the processing and handling of liquefied natural gas which is stored by public utilities in cryogenic tanks for vaporization into gas during periods of peak demand. LNG transportation firms also represent an important and growing market for turbocompressors and submerged motor pumps.

Large plant expansion announced Construction has been started on a new 50,000-square-foot, high-bay addition to the four-year-old Irvine, California plant, which will double the manufacturing capacity of that facility. Completion is scheduled for late 1971.

Products: *Cryogenic and mechanical equipment; high-pressure, centrifugal and submerged motor pumps; turbines, turbocompressors and turboexpanders; high-performance electric motors and alternators; closed-cycle refrigerators; food freezing equipment; vaporizers and heat exchangers; life support equipment; carbon dioxide pelletizers; aircraft ground support equipment; integrated systems.*

Plants: *Irvine, Calif.; Basle, Switzerland (Cryostar AG).*

Markets: *Industrial gas, food, liquefied natural gas, aerospace, electronics, research, petrochemical, shipbuilding.*

Top: *Paul P. Duro[illegible] Airco Cryogenics, insp[illegible] turbocompressor built [illegible] division's Ir[illegible] California f[illegible]*

Center left: *Main entran[illegible] the executive offic[illegible] manufacturing plant of [illegible] Cryogenics in I[illegible]*

Bottom left: *"KwikF[illegible] food freezing sy[illegible]tem inst[illegible] at Kitchens of Sara L[illegible]*

Bottom ri[illegible]

LNG liquefaction [illegible] constructed by Cryogenics as a subcontra[illegible] for Airco/BOC joint ve[illegible] Unit is shown insta[illegible] San Diego Gas & [illegible] plant in Cali[illegible]

A 4572
CX-125-67

Ex-175-D

A 4573

Sales advanced slightly to new record; earnings reduced by economic downturn and automotive strike in last quarter

Sales of the Airco Welding Products Division, which markets gases and welding equipment almost exclusively through independent distributors, established a new sales record slightly above the previous high set in 1969. Most of the sales increase was attributed to the MAPP gas and equipment business. During the first three quarters, sales and earnings were well ahead of 1969 levels. However, the decline in the general economy, accentuated by the automotive strike, had a very depressing effect on the division's performance in the last quarter when sales and earnings dropped sharply.

Canadian welding business sold On September 30, 1970, Airco sold two Canadian welding facilities, as well as related equipment and patents, to Canadian Oxygen Limited (Canox), a wholly owned subsidiary of British Oxygen Company Limited, for $8.5 million in cash. Canox now is the Canadian distributor for a broad range of Airco welding and cutting products.

New consumer-oriented products successfully introduced During 1970, the division emphasized further penetration into the light-gauge metals business by introducing several readily accepted new products having strong consumer appeal, including a portable Fast-Pak Welder specifically developed for low-cost autobody repair and sheet metal work; economical packaged welding outfits for homeowners, artists and contractors; and a MAPP Air Torch and cylinder gas kit for the refrigeration and air conditioning markets. Also introduced in 1970 were two very promising new products for industrial applications: an arc welder designed to join light-gauge aircraft tubing, and a plasma welding unit for general fabrication of thin metal sections.

Products: *Oxy-acetylene, oxy-MAPP, arc welding and inert gas-shielded arc welding and cutting equipment; [illegible] welding accessories and safety equipment; cylinder gases and [illegible]; Aronson positioners, turning rolls and vibratory stress relieving equipment.*

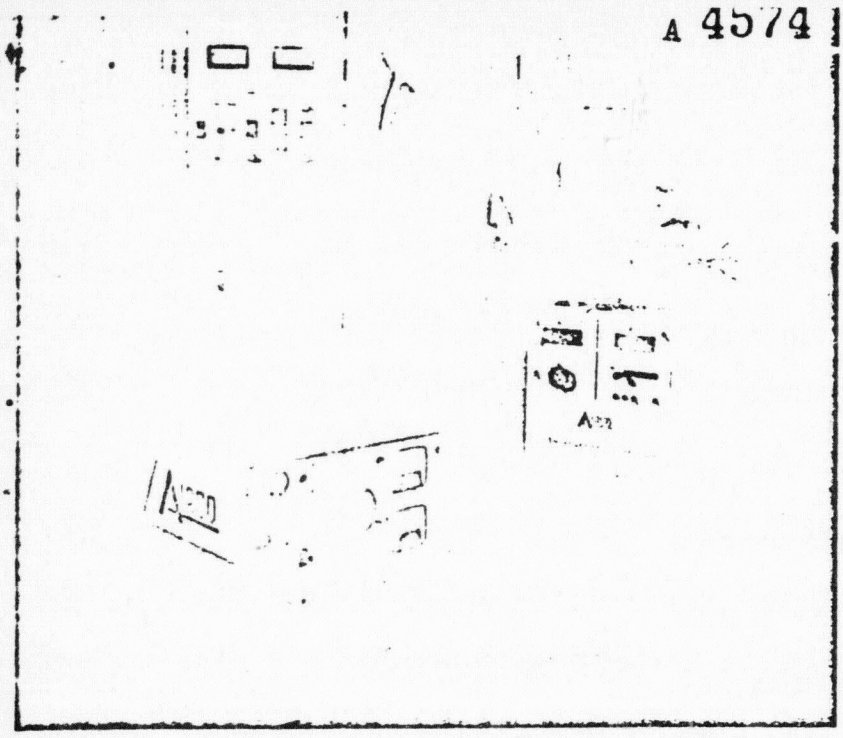
Plants: *Arcade, N.Y.; Chester, W. Va.; Cleveland, Ohio; Sparrows Point, Md.; Union, N.J.; Warren, Mich.; 23 acetylene generating plants.*

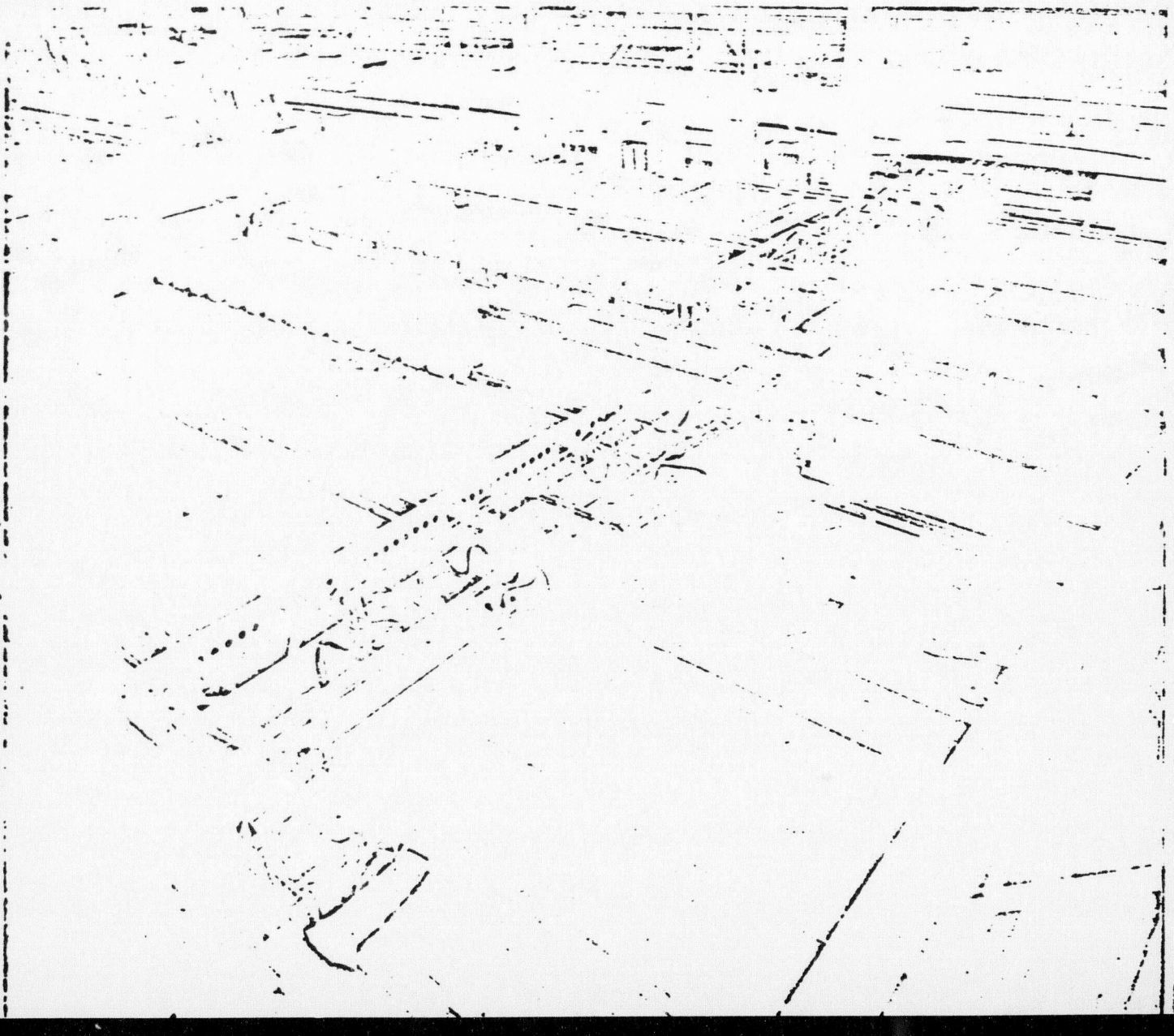
Markets: *Machinery and appliances, railroad and shipbuilding, metal fabricating, automotive, iron and steel, electrical equipment and electronics, aircraft and aerospace, Federal Government, and through several hundred franchised domestic distributors and company-owned Sales & Service Centers.*

Top left: [illegible] Koehler, President [illegible] Welding Products, checks [illegible] products in the development laboratory at the welding equipment manufacturing plant, Union, New Jersey. **Top right:** *Operator rides special elevator as Airco Automatic Vertical Airco Welder (AVA) Welder travels 48-foot seam to join 1¼"-thick steel plates for largest boats ever built for Great Lakes traffic. Work is being done at Erie Marine Division of Litton Industries, Erie, Pennsylvania.* **Bottom:** *Airco [illegible] at the new Ingalls West Bank yard, Pascagoula, Mississippi. These numerically controlled multitorch machines automatically cut complex shapes out of heavy steel plate.*

A 4574

CX-175-5





CX-175-T

Sales advanced 14% to achieve all-time high; five-week strike in new plant penalized earnings

Sales of the Ohio Medical Products Division again established a new record, with all product segments participating in the 14 per cent increase during 1970. The division's new line of disposable breathing circuits, introduced in 1969, made the strongest contribution to the outstanding results. Earnings were hurt by a five-week strike at the new manufacturing plant, almost immediately after its completion in the second quarter of 1970.

New Madison facility substantially increases production capacity During 1970, Ohio Medical Products moved its offices and hospital equipment manufacturing operations into new and ultra-modern facilities occupying about half of a 166-acre site in Madison, Wisconsin. The 204,000-square-foot manufacturing facility, on-stream since April, 1970, doubles the production capacity of the former plant, and features the latest tape-programmed machine tools and conveyor materials handling systems for processing over 18,000 parts for life support equipment. Since mid-November, the new 96,000-square-foot head office building has been fully operational.

New products emphasize care of the newborn Among the several new products introduced in 1970 were two items specifically developed for the growing field of neonatology (care of the newborn). The most significant product introduced was a mobile incubator for safely and quickly transporting premature or critically ill newborn from home to hospital, from hospital to regional neonatal intensive care centers, or from one hospital department to another. Also introduced was a new type of water-saturated aerosol tent for use in pediatric and cystic fibrosis mist therapy.

Diagnostic equipment line gains good acceptance Sales increased moderately for Ohio Medical's newly acquired (1969) line of computer-oriented pulmonary testing equipment designed for diagnosis of respiratory diseases, such as emphysema, chronic bronchitis, asthma and related respiratory disorders.

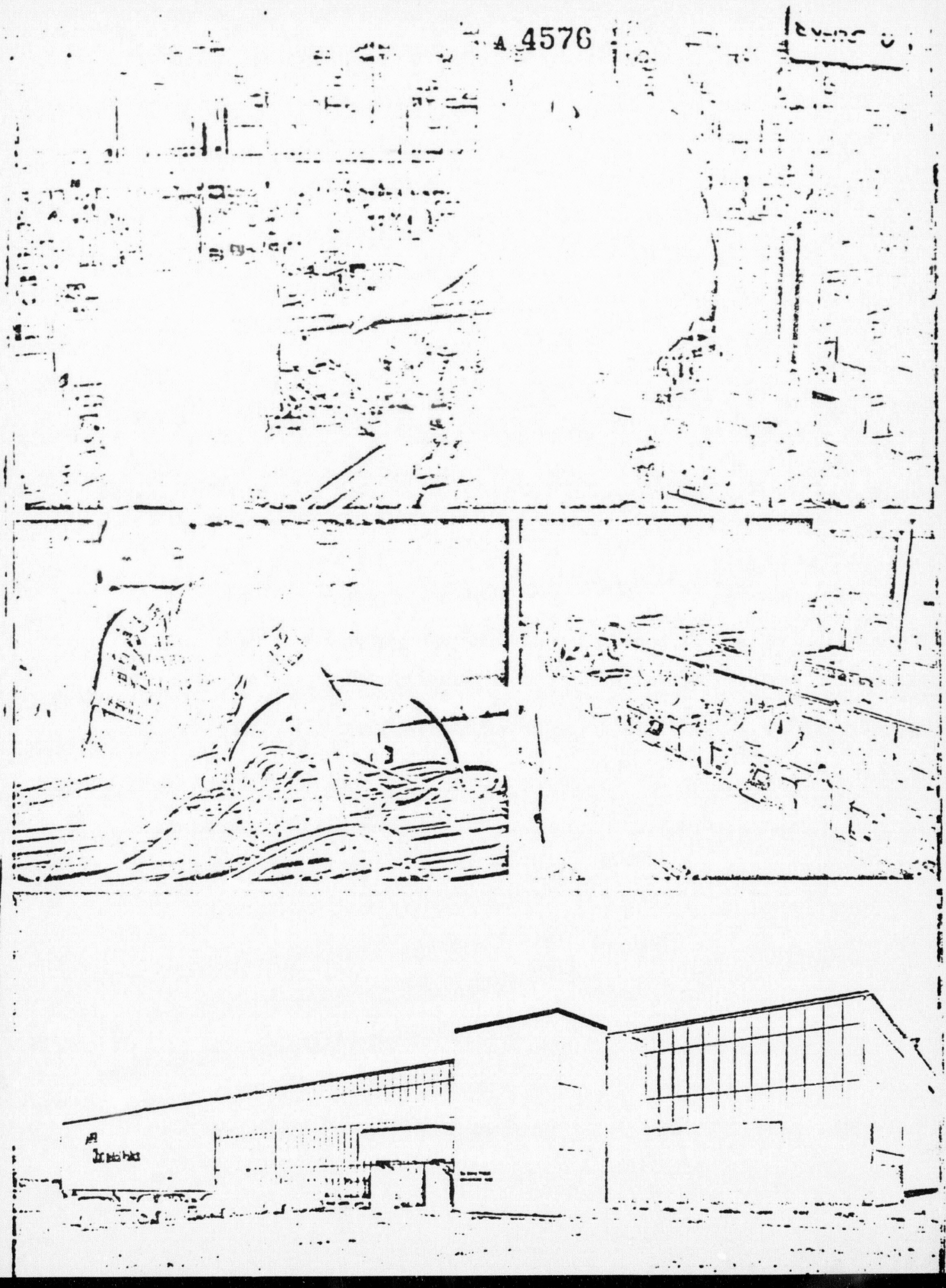
Products: *Anesthetic agents and medical gases, anesthesia apparatus, inhalation therapy and resuscitation equipment, hospital piping systems, infant incubators, respirators, cryosurgery equipment, pulmonary function testing equipment.*

Plants: *Berkeley, Calif.; Cleveland, Ohio; Fort Myers, Fla.; Houston, Tex.; Lodi, N. J.; Madison, Wis.; Toronto, Canada (Ohio Medical Products Canada).*

Markets: *Hospitals, clinics and nursing homes; medical and dental professions.*

Top: *William A. Lunzer, President, Ohio Medical Products, flanked by anesthesia machines on balcony overlooking assembly area of the new medical equipment plant in Madison, Wisconsin.*
Center left: *William V. Ballweg installs hoses on medical gas manifold designed for ceiling mounting in a hospital.*
Center right: *In a specially designed temperature- and humidity-controlled room in the Madison plant, Gladys E. Winchester tests calibrations of infant incubators prior to shipment.*
Bottom: *Exterior view of recently completed medical equipment plant in Madison.*

A 4576



A4577

Major advances made in metallurgical processes and in medical and pollution control programs

In 1970, Airco invested more than $8.7 million in research and development activities in continuing operations to provide strong technical backup to all divisions, with particular emphasis given to metallurgical, medical and pollution control programs. This figure is nearly five per cent higher than the $8.3 million invested in continuing operations during 1969. In addition to conducting research and advanced engineering programs for all Airco divisions at the Central Research Laboratories in Murray Hill, New Jersey, Airco conducts carbon, graphite and electronics basic and applied research in a laboratory at Niagara Falls, New York. Eleven other development laboratories are operated at major divisional manufacturing plants.

New techniques augur economies, expanded applications A new powder metallurgy process—much simpler than conventional methods—offers advantages over molten metal casting. Field tests on welding rods made by the new process have been successful, and a variety of other uses are now being explored.

Intensive physico-chemical investigations of E-Brite 26-1 stainless steel have led to several new applications for the alloy, such as heating elements for electric stoves and industrial ovens.

Airco metallurgists developed a sophisticated technique for fabricating °Kryoconductor superconductors with up to 360 strands of wire totalling only eight-thousandths of an inch in diameter. These superconductors are used in magnets for high-energy particle studies.

Two anesthetics show great promise Clinical trials continue to demonstrate the outstanding properties of two new anesthetic compounds—

with Forane indicate that both agents show good potential.

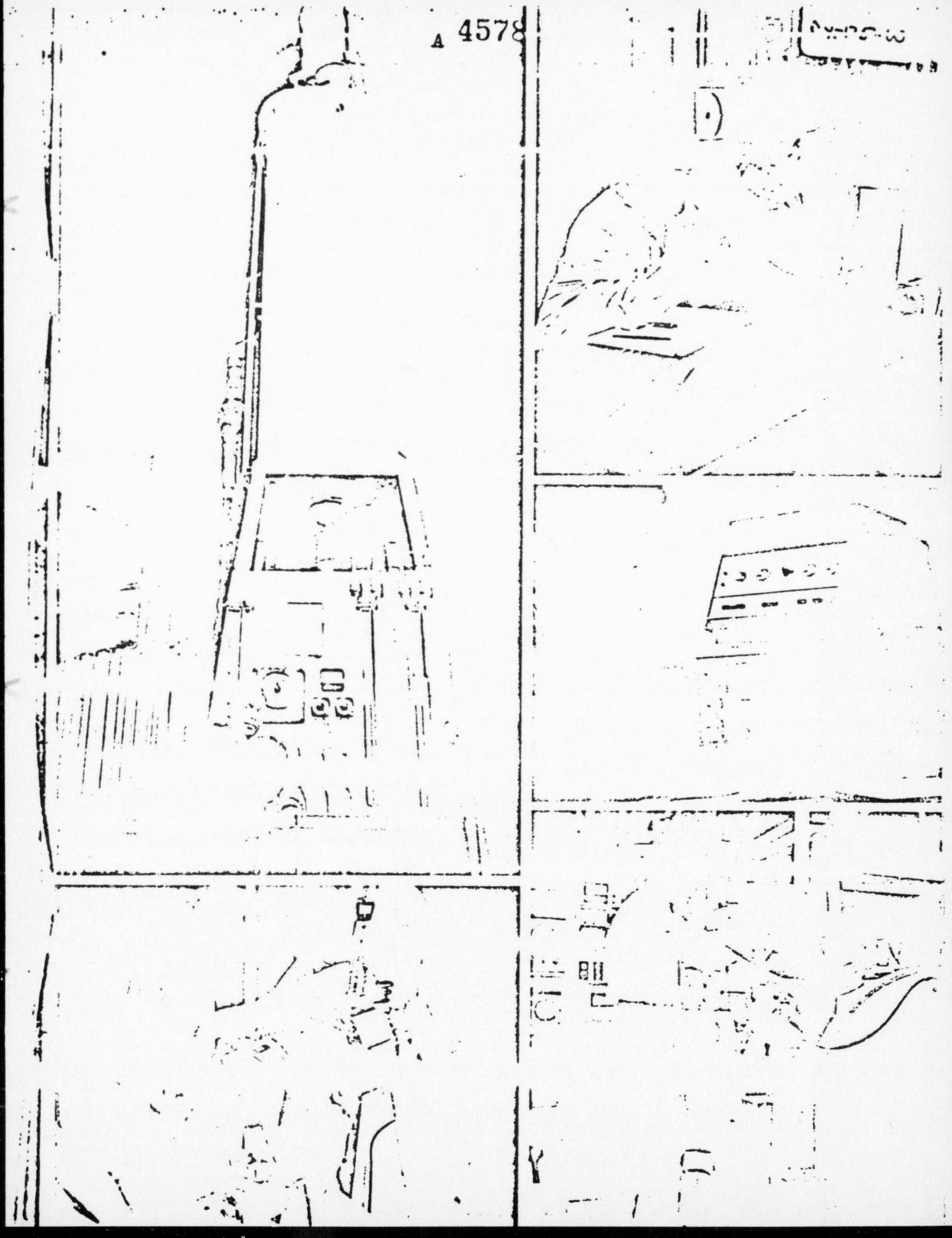
Pollution control projects effective A portable pilot plant for secondary water treatment has demonstrated its effectiveness on waste at one industrial and several municipal locations.

The ozone tertiary sewage treatment plant, built under an Environmental Protection Agency contract, is on-stream and operating successfully at Washington, D.C.

A system which completely removes radioactive krypton and xenon from nuclear power plant waste gases has been constructed.

Photo highlights of major 1970 activities at Airco's Central Research Laboratories, Murray Hill, New Jersey, include: **Top left:** *Gordon J. Arquette, Airco's Director*

shown at the base of a ... developed fractionating column designed to extract radioactive materials from nuclear power plant waste gases. **Top right:** *Harb Nayar, Senior Metallurgist (left), examines cast iron rods emerging from a sintering furnace that converts powdered metal into welding rods. Gerard Romano, Senior Technician, ... furnace tech...* **Center right:** *Anodic polarization measurements being taken by James Dickson, Research Engineer, aid development of new alloys with improved corrosion properties.* **Bottom left:** *Observing the melting point of ... (refuse from processed ore). George R. Mal... Technician, obtains ... data which will lead to improvements in ferroalloy operations.* **Bottom right:** *Metallurgist Fred K. Kies prepares a melt of modified E-Brite 26-1 stainless steel in a vacuum induction furnace.*


A 4578

A 4579

Management development course established; new Welding Training Center for New York

At the end of 1970, there were 12,709 office and plant personnel employed by Airco in its continuing domestic and foreign operations. This represents a slight decrease compared with the 12,797 employed on the same basis in 1969.

During the year, 59 collective bargaining agreements were negotiated of a total 124 in effect in 1970. All but four were settled without work stoppage. In addition, two unauthorized strikes occurred in violation of existing labor contracts. All disputes were finally resolved on generally satisfactory terms.

Managers complete course A new management development course for Airco mid-management was started in 1970. The two-week course was designed to provide high-potential personnel with advanced management techniques for practical use on the job. Prepared and presented by prominent business school professors, assisted by Airco management, the program included lectures, case studies and workshop sessions on decision making, financial analysis, planning and motivation. Twenty-eight managers from various Airco operations completed the first session. A similar group is scheduled for the course in 1971.

Airco facilities win safety awards In 1970, 13 Airco laboratories and plants received safety recognition awards from the Manufacturing Chemists Association for completing a full year without a disabling injury.

Cleveland Training Center sets stage for New York Since it began in November 1968, the Airco Welding Training Center in Cleveland has graduated 249 skilled welders. These graduates are earning from $2.90 to $4.30 per hour with 61 firms in the Cleveland area—representing a combined annual income estimated at $1.8 million. There are 42 trainees currently enrolled in the program. This demonstrated success led the Commerce Labor Industry Corporation of Kings (CLICK), an organization established by the City of New York to operate the former Brooklyn Navy Yard, to select Airco to train the unemployed and underemployed in the skills of welding, cutting and shipfitting. The Center is part of CLICK's program to help relieve employment problems in the area adjacent to the Navy Yard. The Airco Training Center is scheduled for start-up in the spring, with about 500 persons expected to be trained in the first twelve months. All graduates will be employed by various tenants of the Navy Yard, principally Seatrain Shipbuilding Corp. The major portion of the program, as with the Cleveland Center, is funded by the Federal Government.

Top: *Martin A. Hand... Assistant to the President ... in charge of training ... grams for the underemp... and unemployed (left) ... LeCogbill E. Friend, Ad... istrator of Airco's ... Welding Training Cente... the Brooklyn Navy Yard ... tour the drydock area ... Yard. Other Airco pe... at work around the ...*

Top row: *(l to r) Jos... Onofrietti, Welding Produ... Union, New Jersey; Ric... J. Maloney, Industrial Ga... Morrisville, Pennsylv... Kalsan Bte. Bulap, Speer E... tronics, Singapore; John ... Stations, Ohio Medical P... ducts, Madison, Wisc...*

Middle row: *(l to r) Gadd... Mendoza Garcia, Spe... Electronics, Nogales, Mexi... Susan Gilronan, A... and Carbide, London, En... land; Fred J. Smith, Spe... Carbon-Graphite, Niagara ... Falls, New York; William ... G... Berkeley, Calif...*

Bottom row: *(l to r) Kathryn ... Havlik, Ohio Medi... Products, Madison, Wis... sin; Edward C. Snow, ... Welding Products, Union, ... New Jersey; Jose C. Gonzale... Viking, Verdi, Nevada...*

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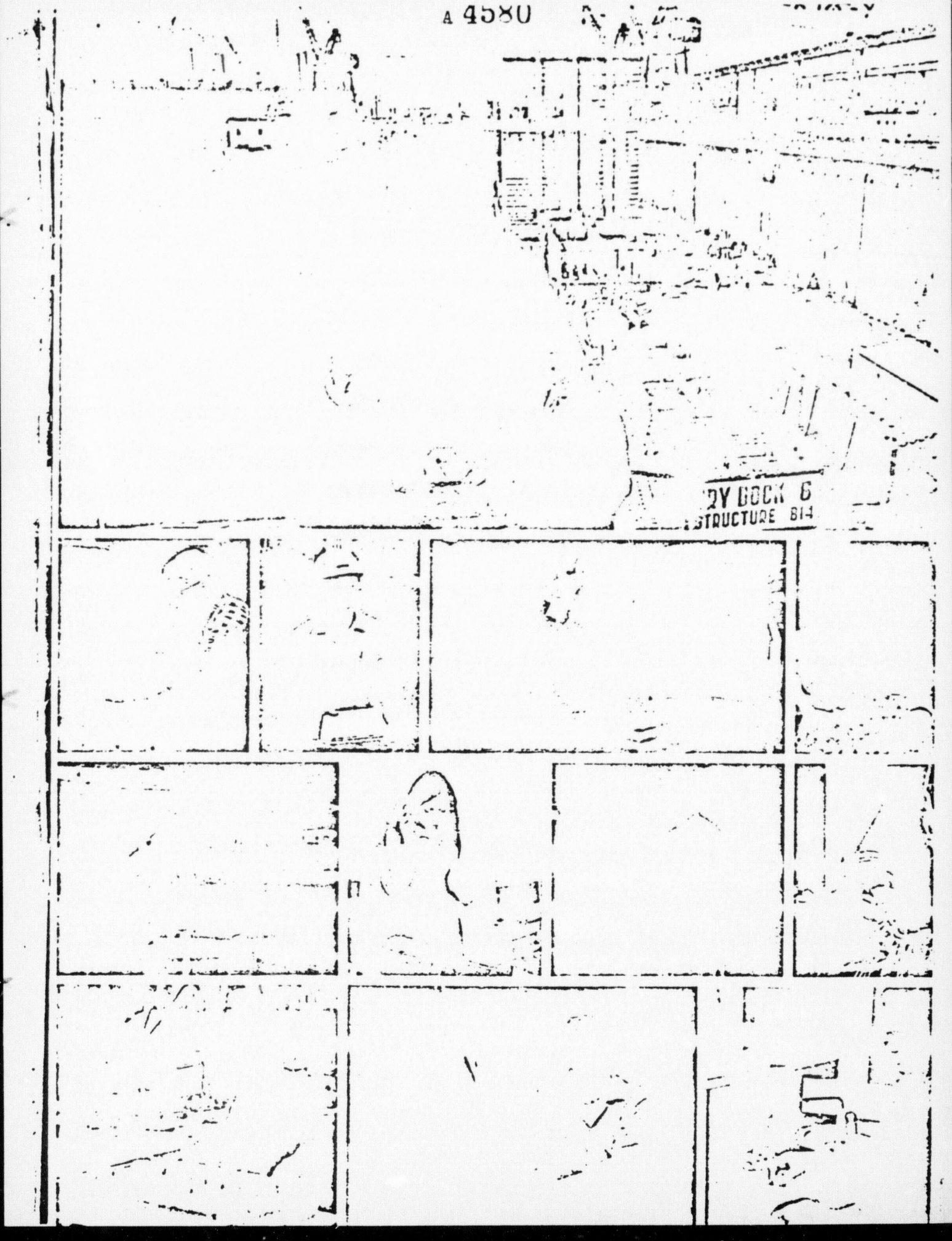
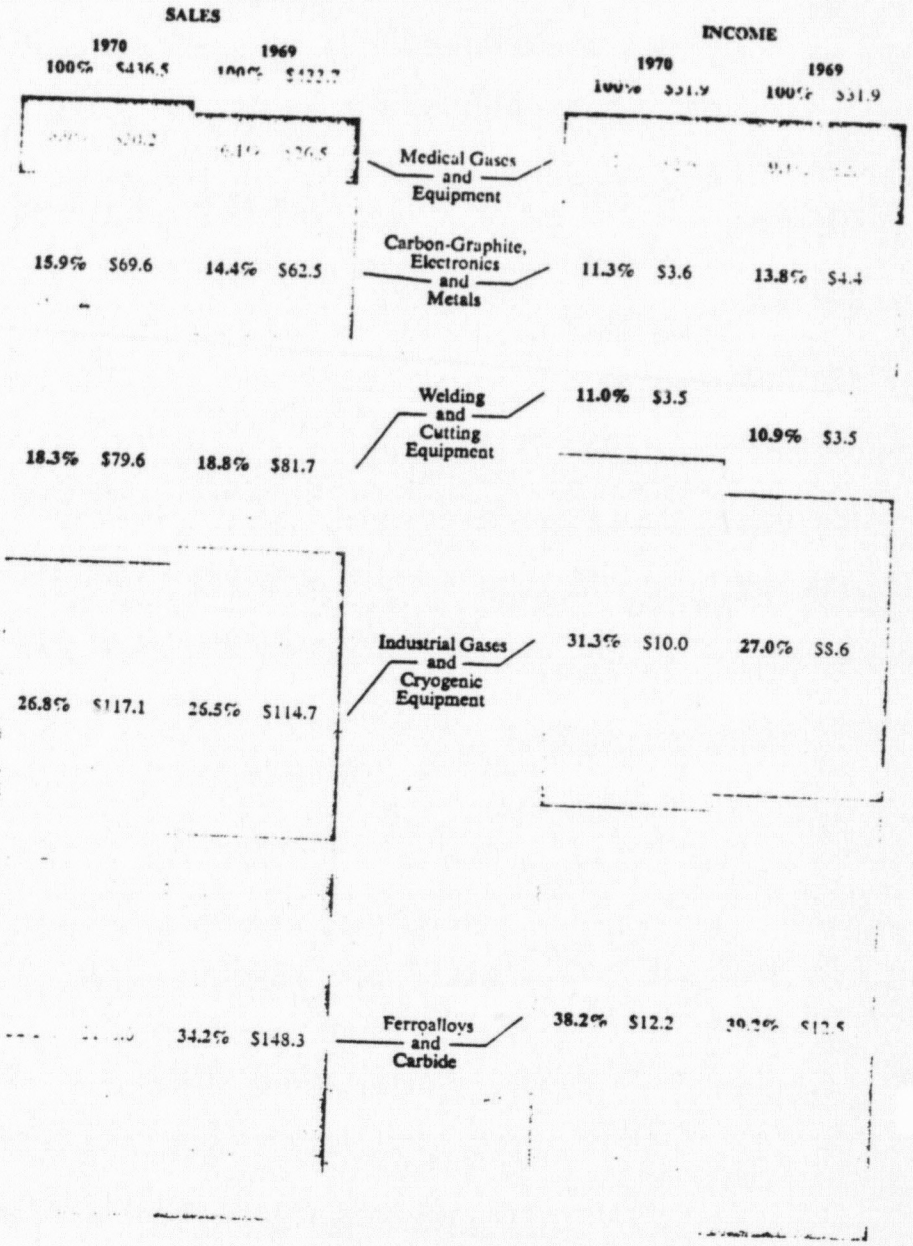


A 4581

Ex-12.5-2

SALES AND INCOME BEFORE TAXES BY PRODUCT LINE

(millions of dollars)



Above figures reflect continuing operations.

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EX-125-2-1

Statement of Consolidated Income

FOR THE YEARS ENDED DECEMBER 31, 1970 AND 1969

	1970	1969 (Note I)
Net Sales	$436,501,000	$433,665,000
Other Income—Net	4,969,000	3,740,000
Total	441,470,000	437,405,000
Deductions		
Cost of Goods Sold	335,109,000	336,459,000
Selling, Administrative and Other Expenses	62,903,000	58,801,000
Interest Expense	11,558,000	10,234,000
Federal and Foreign Taxes on Income (Note H)	13,605,000	11,763,000
Total	423,175,000	417,257,000
Income From Continuing Operations	18,295,000	20,148,000
(Loss) Income From Discontinued Operations (Note I)	(1,301,000)	178,000
Income Before Extraordinary Items	16,994,000	20,326,000
Extraordinary Items, Net of Income Taxes (Note I)	(10,500,000)	—
Net Income	$ 6,494,000	$ 20,326,000
Earnings Per Share of Common Stock (Note J)		
Income From Continuing Operations	$1.60	$1.78
(Loss) Income From Discontinued Operations	(.11)	.02
Income Before Extraordinary Items	1.49	1.80
Extraordinary Items, Net of Income Taxes	(.92)	—
Net Income	$ .57	$1.80
Fully Diluted Earnings Per Share (Note J)		
Income From Continuing Operations	$1.51	$1.67
(Loss) Income From Discontinued Operations	(.10)	.01
Income Before Extraordinary Items	1.41	1.68
Extraordinary Items, Net of Income Taxes	(.84)	—
Net Income	$ .57	$1.68

See accompanying notes to financial statements.

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CX-175-
2 2

Consolidated Balance Sheet

DECEMBER 31, 1970 AND 1969

ASSETS	1970	1969
CURRENT ASSETS		
Cash	$ 14,691,000	$ 17,444,000
Notes and Accounts Receivable (less allowances for doubtful accounts—1970, $672,000; 1969, $1,234,000)	85,846,000	85,435,000
Receivable from Disposition of Properties (Note I)	9,288,000	–
Inventories (Note B)	105,295,000	101,327,000
Prepaid Expenses	3,360,000	3,581,000
Total Current Assets	218,480,000	207,787,000
PROPERTY, PLANT AND EQUIPMENT—NET (Note C)	311,915,000	319,729,000
INVESTMENTS (at cost, which approximates equity in underlying assets)	5,307,000	4,899,000
LONG-TERM RECEIVABLES	16,000,000	3,564,000
DEFERRED CHARGES	7,872,000	6,682,000
GOODWILL, PATENTS AND TRADEMARKS (net of amortization) (Note D)	5,009,000	7,549,000
TOTAL	$564,583,000	$550,210,000

See accompanying notes to financial statements.

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EX-175-
2-3

LIABILITIES AND STOCKHOLDERS' EQUITY	1970	1969
CURRENT LIABILITIES		
Accounts Payable	**$ 27,840,000**	$ 34,150,000
Currently Maturing Long-Term Debt (Note E)	**5,610,000**	2,243,000
Accruals	**19,052,000**	15,481,000
Federal and Foreign Taxes on Income (Note H)	**2,847,000**	3,091,000
Total Current Liabilities	**55,349,000**	54,965,000
LONG-TERM DEBT (less currently maturing portion) (Notes E and F)	**190,497,000**	179,328,000
DEFERRED INCOME TAXES (Note H)	**62,990,000**	59,695,000
STOCKHOLDERS' EQUITY (Notes E, F and G)	**255,747,000**	256,222,000
TOTAL	**$564,583,000**	$550,210,000

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EX-175-
2-4

Statement of Stockholders' Equity

FOR THE YEARS ENDED DECEMBER 31, 1970 AND 1969

	Common Stock —$1 par value	*Capital in Excess of Par Value*	*Retained Earnings*	*Treasury Stock —at cost*	*Total Stockholders' Equity*
Balance at January 1, 1969, as Restated (Note A)	$11,293,000	$104,665,000	$131,951,000	$(1,453,000)	$246,456,000
Net Income			20,326,000		20,326,000
Conversion of 3⅞% Debentures (principal amount $315,000) (Note F)	10,000	303,000			313,000
Stock Issued Under Employee Stock Purchase Plans (Note G)	59,000	1,020,000		955,000	2,034,000
Stock Option Plans (Note G)	4,000	65,000			69,000
Dividends on Common Stock ($1.15 per share)			(12,863,000)		(12,863,000)
Purchased for Treasury (6,000 shares)				(113,000)	(113,000)
Balance at December 31, 1969	11,366,000	106,053,000	139,414,000	(611,000)	256,222,000
Net Income			6,494,000		6,494,000
Stock Issued Under Employee Stock Purchase Plan (Note G)	155,000	2,039,000			2,194,000
Dividends on Common Stock ($.80 per share)			(9,163,000)		(9,163,000)
Balance at December 31, 1970	$11,521,000	$108,092,000	$136,745,000	$ (611,000)	$255,747,000

See accompanying notes to financial statements.

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EX-125-
2-5

Source and Application of Funds

FOR THE YEARS ENDED DECEMBER 31, 1970 AND 1969

	1970	1969
SOURCE OF FUNDS		
From Operations		
Net Income	**$ 6,494,000**	$ 20,326,000
Charges not Requiring Current Outlays		
Depreciation and Amortization (Note C)	**27,867,000**	27,247,000
Deferred Income Taxes (Note H)	**3,295,000**	7,128,000
Total from Operations	**37,656,000**	54,701,000
Proceeds from Long-Term Debt	**66,774,000**	30,845,000
Sale of Stock to Officers and Employees (Note G)	**2,194,000**	1,821,000
Reduction in Non-Current Assets from Disposition of Certain Businesses and Properties Net of Non-Current Receivables of $11,587,000 (Note I)	**19,724,000**	—
Other—Net	**(1,371,000)**	3,323,000
Total	**124,977,000**	90,695,000
APPLICATION OF FUNDS		
Capital Expenditures for Property, Plant and Equipment (Note C)	**49,900,000**	55,300,000
Purchase of Contract Rights to Production and Distribution (Note C)	**—**	5,250,000
Dividends on Common Stock	**9,163,000**	12,863,000
Reduction in Long-Term Debt	**55,605,000**	2,490,000
Treasury Shares Purchased	**—**	113,000
Total	**114,668,000**	76,016,000
Increase in Net Working Capital During Year	**10,309,000**	14,679,000
Net Working Capital at Beginning of Year	**152,822,000**	138,143,000
Net Working Capital at End of Year	**$163,131,000**	$152,822,000

See accompanying notes to financial statements.

EX-175-
2-6

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Notes to Financial Statements

A. PRINCIPLES OF CONSOLIDATION The accounts of all significant subsidiaries of the Company are included in the consolidated financial statements. The net assets of foreign subsidiaries included in the consolidated financial statements, were $17,216,000 at December 31, 1970 and $19,533,000 at December 31, 1969; the net income so included was $2,004,000 in 1970 and $2,158,000 in 1969.

In 1969, the Company acquired all the outstanding stock of one company for cash and, in transactions accounted for as poolings of interests, the net assets and businesses of five other companies in exchange for 215,119 shares of Common Stock (including 82,619 shares held in treasury). The operations of the purchased company, which are not material, are included in the financial statements from the date of acquisition. The operations of the pooled companies, which are not material, have been included for the entire year 1969. As a result of these poolings, the equity accounts were restated as of January 1, 1969; Treasury Stock was decreased by $2,536,000, Capital in Excess of Par Value and Retained Earnings were decreased and Common Stock was increased by $690,000, $95,000 and $132,000, respectively, resulting in a net increase in Stockholders' Equity of $1,883,000.

In 1970, the Company made no significant acquisitions. See Note I for dispositions.

B. INVENTORIES Inventories stated at the lower of average cost or market at December 31, 1970 and 1969 are as follows:

	1970	1969
Finished Goods	$ 47,261,000	$ 46,167,000
Goods in Process	17,646,000	17,426,000
Raw Materials and Supplies	40,388,000	37,734,000
Total Inventories	$105,295,000	$101,327,000

C. PROPERTY, PLANT AND EQUIPMENT A summary of property, plant and equipment (at cost) at December 31, 1970 and 1969 is as follows:

	1970	1969
Land	$ 7,885,000	$ 8,293,000
Buildings and Leasehold Improvements	105,161,000	104,867,000
Machinery and Equipment	372,763,000	406,269,000
Construction in Progress	31,173,000	20,543,000
Contract Rights to Production and Distribution	5,250,000	5,250,000
Total	522,232,000	545,222,000
Less Accumulated Allowances for Depreciation, Amortization and Obsolescence	210,317,000	225,493,000
Property, Plant and Equipment—Net	$311,915,000	$319,729,000

Allowances for depreciation and amortization are generally accumulated on a straight-line basis. For the years ended December 31, 1970 and 1969, total depreciation and amortization, including the portion charged to discontinued operations, amounted to $27,867,000 and $27,247,000, respectively.

D. GOODWILL, PATENTS AND TRADEMARKS Goodwill is being amortized on a straight-line basis over a period of 40 years. Patents and trademarks are valued at $1 for financial statement purposes.

E. LONG-TERM DEBT Long-term debt outstanding at December 31, 1970 and 1969 is summarized as follows:

	1970	1969
3⅞% Convertible Subordinated Debentures maturing in 1987 (cash redemptions to commence in 1977)	$ 31,762,000	$ 31,762,000
6½% Sinking Fund Debentures of Foreign Subsidiary maturing in 1987	2,566,000	2,656,000
Notes Payable		
U.S. Banks	67,733,000	52,791,000
Foreign Banks	15,733,000	13,910,000
Promissory Notes		
4¾% maturing in 1973	760,000	1,025,000
4.85% maturing in 1988 (payments of $3,330,000 annually to commence in 1974)	50,000,000	50,000,000
5% maturing in 1982	19,500,000	20,500,000
Miscellaneous Notes of Foreign Subsidiary	887,000	1,125,000
Other (principally mortgages, 2.0% to 9.5%)	7,166,000	7,802,000
Total	196,107,000	181,571,000
Less Currently Maturing Installments	5,610,000	2,243,000
Long-term Debt (less currently maturing portion)	$190,497,000	$179,328,000

Other than the notes payable to foreign banks noted below, the amounts of long-term debt payable annually during the five-year period ending December 31, 1975 are as follows: 1971, $5,610,000; 1972, $2,697,000; 1973, $18,952,000; 1974, $18,443,000; and 1975, $18,413,000. Subject to certain limitations and the payment of premiums, prepayments on all long-term debt may be made.

Notes payable to U.S. banks, bearing interest at 8.75%, at December 31, 1969 were refinanced in 1970. Under the new agreement, the banks are committed to lend $75,000,000 to the Company through December 31, 1972, of which $64,500,000 has been borrowed and is outstanding at December 31, 1970. The notes bear interest at ¼% above the best rate established, from time to time, by one of the participating banks, until December 31, 1972 and thereafter at ½% above the best rate in effect from time to time. At December 31, 1970, the rate of interest in effect was 7%. Repayment of these notes is required to be made in equal semi-annual installments over a five-year period beginning on June 30, 1973.

Notes payable to foreign banks, issued in the acquisition of interests in certain foreign companies, bear interest at 1½%

to ⅝% above the London rate for U.S. dollars, which ranged from 8¼% to 9⅜% at December 31, 1970 and 9⅛% to 13⅛% at December 31, 1969. Payment on these notes is required to begin in 1971, but the Company intends to refinance the notes and consequently no amount is included in current liabilities.

A foreign subsidiary of the Company is party to an agreement under which a foreign bank is committed to lend to the subsidiary up to $3,150,000 at an interest rate of 7%. In addition, the bank is committed to subscribe for up to $1,167,000 Cumulative Redeemable Preference Shares of the subsidiary bearing an 8% dividend rate. At December 31, 1970 and 1969, the subsidiary had borrowed $2,733,000 and $910,000, respectively; none of the preference shares had been issued. The Company has guaranteed all of the obligations of the subsidiary under this agreement.

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payments of cash dividends and the purchase, redemption, or retirement of the Company's capital stock. As of December 31, 1970 and 1969, under the most restrictive of these provisions, the amounts available for such expenditures were approximately $29,500,000 and $56,200,000, respectively.

F. CAPITAL STOCK The authorized capital of the Company consists of 20,000,000 shares of Common Stock at $1 par value each and 1,000,000 shares of Preferred Stock at $5 par value each. At December 31, 1970 and 1969, 11,521,545 and 11,366,287 shares, respectively, of Common Stock were issued, of which 17,963 shares were held in treasury. During 1969, the Company purchased 6,000 shares of its Common Stock and issued, in addition to treasury shares used in poolings of interests (Note A), 30,480 shares (with a cost of $955,000) in connection with the employee stock purchase plans. During 1970, the Company issued 155,258 previously unissued shares in connection with the employee stock purchase plan. None of the Preferred Stock was outstanding at December 31, 1970 and 1969.

At December 31, 1970 and 1969, 1,016,384 shares of authorized unissued Common Stock are reserved for issuance, at $31.25 per share, upon the conversion of the 3¾% Convertible Subordinated Debentures at any time up to August 15, 1987. Additional shares of Common Stock reserved for stock option and stock purchase plans are 368,540 shares in 1970, and 578,716 shares in 1969 (See Note G).

G. STOCK OPTION AND STOCK PURCHASE PLANS

Stock Option Plans—The Company's stock option plans provide that options granted become exercisable in cumulative installments over a five-year period (ten-year period for options granted prior to 1964) at the fair market value (95% thereof for options granted prior to 1962) on the date the options were granted. In addition, the terms of options granted in substitution for existing options of acquired companies generally approximate the terms of such existing options.

A summary of option data for 1970 and 1969 is as follows:

	1970		1969	
	Number of Shares Under Option	*Aggregate Option Price*	*Number of Shares Under Option*	*Aggregate Option Price*
Outstanding, January 1	178,416	$5,479,000	215,526	$7,208,000
Granted	23,000	408,000	25,000	510,000
Exercised	—	—	(3,598)	(69,000)
Terminated	(64,918)	(2,255,000)	(58,512)	(2,170,000)
Outstanding, December 31	136,498	$3,632,000	178,416	$5,479,000
At December 31:				
Exercisable	60,898	$1,774,000	102,516	$3,362,000
Available for grant	20,562		33,562	

Stock Purchase Plans—Pursuant to the employee stock purchase plan, the Company is offering up to a total of 400,000 shares of unissued Common Stock or shares held in treasury, to employees eligible to participate in the plan, at 85% of the closing price of the Company's Common Stock on the New York Stock Exchange on certain quarterly dates.

Through December 31, 1970, an aggregate of 188,520 shares (for consideration of $2,737,000) had been issued of which 155,258 shares (for consideration of $2,194,000) were issued during 1970.

In 1969, the Stockholders also approved the issuance of 25,000 additional shares of Common Stock in connection with the employee stock investment plan of 1953, which terminated during 1969. During 1969 a total of 46,871 shares were issued for an aggregate consideration of $1,209,000 and 9,207 treasury shares having a cost of $282,000 were contributed to employees pursuant to the plan.

H. FEDERAL AND FOREIGN TAXES ON INCOME The Company follows the practice of recognizing the tax effects of transactions in the year in which they enter into the determination of net income, regardless of when they are recognized for tax purposes. Accordingly, Federal and Foreign Taxes on Income includes provisions for deferred taxes on these differences in amounts of $10,135,000, in 1970 and $8,486,000 in 1969. The significant items which give rise to differences are (1) the use of liberalized depreciation and guideline depreciation rates for tax purposes only, (2) allowances for estimated losses on facility abandonments provided for in one year but not deducted for tax purposes until actual abandonment and (3) the deduction of certain other operating expenses for tax purposes which have been deferred for accounting purposes.

The 1970 and 1969 provisions for Federal income taxes relating to continued operations have been reduced by investment credits of $644,000 and $2,693,000, respectively.

I. EXTRAORDINARY ITEMS AND DISCONTINUED OPERATIONS In 1970 and early 1971, the Company sold the Chemicals and Plastics business and certain Canadian properties and disposed of certain electronic product lines, resulting in an extraordinary charge to income of $10,500,000 (net of the related income tax effect of $6,737,000). The net

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sales and related expenses (including Federal income tax effects) applicable to discontinued operations prior to their sale or termination have been excluded from the respective captions in the statement of consolidated income for both 1970 and 1969 and have been shown net under the caption "(Loss) Income From Discontinued Operations". Net sales relating to discontinued operations were $33,175,000, in 1970, and $53,599,000, in 1969.

J. EARNINGS PER SHARE OF COMMON STOCK Earnings per common share are based on the weighted average number of shares of Common Stock outstanding during the respective years. The dilutive effect of the common stock equivalents is not significant.

Fully diluted earnings per share of Common Stock have been computed with appropriate adjustment for common stock equivalents and assuming the conversion of the 3⅞% Convertible Subordinated Debentures at the beginning of each year with related adjustments to income for interest and issue expense, net of income taxes.

K. RETIREMENT PLANS The Company and its subsidiaries maintain retirement plans covering substantially all officers and employees. It is the Company's policy generally to fund the pension cost accrued. Prior service costs of the plans are substantially funded. The total pension expense for the years ended December 31, 1970 and 1969 was approximately $2,798,101 and $2,344,000, respectively.

L. COMMITMENTS AND CONTINGENCIES The unexpended portion of amounts authorized for capital expenditures at December 31, 1970 and 1969 approximated $21,000,000 and $26,000,000, respectively, as to which commitments have been made for approximately $4,300,000 and $12,400,000, respectively. At the same dates the Company was lessee under leases, ending more than three years thereafter (generally within a period of from ten to fifteen years), having aggregate annual rental of approximately $14,000,000, in 1970, and $15,600,000, in 1969. Of these amounts, $8,190,000 and $7,900,000, respectively, relate to tonnage gas plants supplying customers under long-term sales contracts which provide for aggregate minimum revenues covering rentals.

In connection with a joint venture, the Company was committed, in 1970 and 1969, to guarantee up to $5,800,000 of aggregate borrowings of the venture. The amount of outstanding debt relating to such guarantee is $2,686,000 at December 31, 1970 and $2,382,000 at December 31, 1969.

Accountants' Opinion

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TWO BROADWAY
NEW YORK 10004

To the Stockholders of Air Reduction Company, Incorporated:

We have examined the consolidated balance sheets of Air Reduction Company, Incorporated and subsidiaries as of December 31, 1969 and 1970 and the related statements of consolidated income, stockholders' equity, and source and application of funds for the years then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned statements present fairly the financial position of the companies at December 31, 1969 and 1970 and the results of their operations and source and application of their funds for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

HASKINS & SELLS

February 24, 1971.

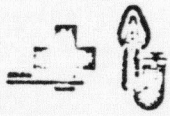
SALES TO INDUSTRIES*

34.7% Steel Mills & Foundries

Machinery 19.0%

11.0% Industrial Chemicals

Medical, Dental & Personal Care 6.7%



6.3% Electrical Equipment & Electronics

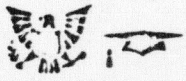
Trades & Services 5.0%

3.8% Aircraft, Space & Defense

Metal Fabricators 2.9%

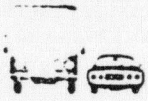
1.9% Foods & Beverages

Transportation (except Highway) 1.8%



1.2% Government & Education

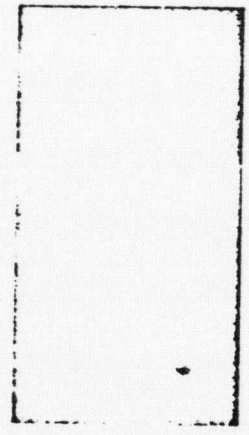
Motor Vehicles 1.2%



4.5% Nonferrous Metals, Glass, and Other Industries

* Continuing operations.

WHERE THE SALES DOLLAR WENT



55.9¢ Materials and Services

29.6¢ Payrolls

5.9¢ Depreciation

5.0¢ Taxes

1.9¢ Dividends Paid

1.7¢ Retained Earnings

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Ten-Year Financial Review

FIGURES IN THOUSANDS EXCEPT PER SHARE DATA

	1970	1969**	1968**
Sales and Earnings			
Net sales*	$436,501	433,665	383,197
Income before taxes*	$ 31,900	31,911	32,139
Income from continuing operations	$ 18,295	20,148	20,423
Income (loss) from discontinued operations	$ (1,301)	178	(960)
Income before extraordinary items	$ 16,994	20,326	19,463
Extraordinary items	$(10,500)	—	1,515
Net income	$ 6,494	20,326	20,978
Average number of common shares outstanding	11,432	11,303	11,108
Earnings per share of common stock from continuing operations*	$ 1.60	1.78	1.84
Dividends Paid			
Dividends per common share	$ .80	1.15	1.50
Dividends on common stock	$ 9,163	12,863	16,647
Dividends by acquired companies	$ —	—	—
Financial Position			
Total assets (less applicable reserves)	$564,583	550,210	498,624
Working capital	$163,131	152,822	138,143
Gross property account	$522,232	545,222	523,181
Depreciation and amortization*	$ 25,350	23,848	22,623
Long-term debt	$190,497	179,328	150,339
Stockholders' Equity			
Amount	$255,747	256,222	244,573
Common stock outstanding—shares	11,504	11,348	11,036
Per share	$ 22.23	22.58	22.16

*Continuing operations. Earnings per share of common stock are before discontinued operations and extraordinary items.

**Financial and operating results of companies acquired in poolings of interests in 1969 and 1968 are included from periods of acquisition. Other years have not been restated since, in the aggregate, operations of these companies for all periods are not material in relation to consolidated net sales and net income.

EX-175-
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1967	1966	1965	1964	1963	1962	1961
368,042	380,692	329,744	298,412	271,542	251,830	237,228
43,998	52,002	44,724	33,776	33,963	32,732	31,450
26,205	31,577	25,668	19,398	18,237	17,565	15,248
(1,490)	(2,270)	(13)	(691)	(502)	(311)	(1,049)
24,715	29,307	25,655	18,707	17,735	17,254	14,199
(12,000)	—	—	—	(3,097)	(3,030)	—
12,715	29,307	25,655	18,707	14,638	14,224	14,199
10,855	10,596	10,239	10,166	10,050	9,952	9,797
2.41	2.98	2.51	1.91	1.81	1.76	1.56
1.50	1.25	1.25	1.25	1.25	1.25	1.25
16,101	12,918	12,803	12,697	12,565	11,468	10,195
142	136	—	—	—	1,025	1,326
467,199	446,561	414,556	388,169	350,683	316,300	300,853
134,008	112,341	95,797	91,239	94,260	68,595	57,452
482,567	458,440	438,788	414,136	362,481	353,241	329,995
17,824	16,988	14,458	13,862	12,836	13,040	12,407
140,536	131,151	124,611	124,527	99,902	83,078	67,350
242,653	227,803	211,887	196,576	185,018	182,953	177,116
11,092	10,620	10,290	10,201	10,066	10,026	9,832
21.88	21.45	20.59	19.27	18.38	18.25	18.01

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EX-175-
2-12

Directors

*GEORGE S. DILLON
President and Chief Executive Officer

*JOHN A. HILL
Chairman of the Executive Committee

*CHARLES S. MUNSON
Honorary Chairman of the Board

RICHARD G. FOLSOM
President, Rensselaer Polytechnic Institute

*CLARENCE FRANCIS
Industrialist; Retired Chairman of the Board, General Foods Corporation

JOSEPH H. HUMBERSTONE
Group Vice President

*R. L. IRELAND III
Partner, Brown Brothers Harriman & Co.

**KEITH S. McHUGH
Director of various corporations; formerly Commissioner of Commerce—State of New York

**CROCKER NEVIN
Chairman of the Board, Marine Midland Bank—New York

JOHN S. SHAW, JR.
President and Chief Executive Officer, Southern Natural Gas Company

HUGH R. SMITH, JR.
President, Airco Temescal Division

DOUGLAS B. STEIMLE
Partner, Shearman & Sterling

*Executive Committee—1970
*Audit Committee—1970

Officers

GEORGE S. DILLON
President and Chief Executive Officer

JOSEPH H. HUMBERSTONE
Group Vice President

RICHARD V. GIORDANO
Group Vice President

NORRIS B. McFARLANE
Group Vice President

DAVID J. CRAIG
Vice President—Planning and Development

DAVID H. LYALL
Vice President—Finance

DONALD REICH
Vice President—Administration

DONALD B. BUSSEWITZ
Controller

HENRY M. KOSTER
Treasurer

JOSEPH M. WALSH, JR.
Secretary

Divisions and Foreign Subsidiaries

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AIRCO ALLOYS AND CARBIDE DIVISION
3801 Highland Avenue, Niagara Falls, N.Y. 14305
Telephone: (716) 285-1252
Theodore E. Dann, *President*

Airco Alloys AB
S-460 60 Vargon, Sweden
Stig Tjernstrom, *Managing Director*

Airco Alloys and Carbide Ltd.
2-4 King Street, London, S.W.1, England
Robert D. Quinn, *General Manager—International Sales*

Airco Alloys G.m.b.H.
Mindener Strasse 4, Cologne-Deutz 5, West Germany
Heinz Goldberg, *Managing Director*

AIRCO CRYOGENICS DIVISION
1900 Main Street, Irvine, Calif. 92664
Telephone: (714) 540-3010
Paul P. Duron, *President*

Cryostar AG
4133 Pratteln, Basle, Switzerland
Helmut Bauer, *Managing Director*

AIRCO INDUSTRIAL GASES DIVISION
575 Mountain Avenue, Murray Hill, N. J. 07974
Telephone: (201) 464-8100
Charles H. Simpson, *President*

N.V. Airco Continental S.A.
Noorderlaan 87, Antwerp, Belgium
Remi Swysen, *General Manager*

AIRCO SPEER CARBON-GRAPHITE DIVISION
800 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2801
Thomas H. Way, *President*

Speer Carbon Co. of Canada Ltd.
3200 Sartelon Street, St. Laurent, Montreal 382, Quebec
Grant M. Greenfield, *Vice President & General Manager*

AIRCO SPEER ELECTRONICS DIVISION
800 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2801
Lawrence M. Liggett, *President*

Airco de Mexico S.A. de C.V.
Calle Hermosillo 451, Nogales, Sonora, Mexico
Robert E. Bru[illegible], *General Manager*

Airco Singapore Pte., Ltd.
31 International Road, Jurong Industrial Estate, Singapore, 22
Stanley L. Foster, *General Manager*

AIRCO TEMESCAL DIVISION
2850 Seventh Street, Berkeley, Calif. 94710
Telephone: (415) 841-5720
Hugh R. Smith, Jr., *President*

Airco Temescal N.V.
Building 70, P.O. Box 7709, Schiphol-Oost, Netherlands
Joseph De Bie, *Managing Director*

AIRCO VACUUM METALS DIVISION
735 Ashby Avenue, Berkeley, Calif. 94710
Telephone: (415) 845-1140
John P. Strand, *President*

AIRCO VIKING DIVISION
#1 Erik Circle, P.O. Box 339, Verdi, Nev. 89439
Telephone: (702) 345-0345
M. Victor Walberg, *President*

AIRCO WELDING PRODUCTS DIVISION
P.O. Box 281, Clermont Terrace, Union, N. J. 07083
Telephone: (201) 354-1212
Lawrence W. Kunkler, *President*

OHIO MEDICAL PRODUCTS DIVISION
3030 Airco Drive, P.O. Box 1339, Madison, Wis. 53701
Telephone: [illegible]
William A. Lunger, *President*

Air Reduction Canada Ltd.
(Ohio Medical Products Canada)
895 Hodge Street, St. Laurent, Montreal 379, Quebec
Raymond J. Fortin, *Marketing Manager*

The following trademarks of Air Reduction Company, Incorporated, appear in this Report: Airco, Airco/BOC, Aronson, AVA, Cryostar, EBHR, E-Brite, Ethrane, Fast-Pak, Forane, Jackson, Kostkutter, °Kryoconductor, °KwikFreeze, M&PP, Ohio, Sky-Cold, Speer, Tape-O-Graph, Temescal, Viking.

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AMCO

Annual Report

CX-176-B

A 4596

	1971	1970	Percent Change
Sales	$440,562,000	$436,501,000	+ 0.9%
Income Before Taxes	33,079,000	31,900,000	+ 3.7%
Income From Continuing Operations	19,063,000	18,295,000	+ 4.2%
Income Per Share From Continuing Operations	1.64	1.60	+ 2.5%
Dividends Paid Per Share	.80	.80	—
Working Capital	180,991,000	163,131,000	+10.9%
Working Capital Ratio	4.4	3.9	—
Depreciation	26,616,000	25,350,000	+ 5.0%
Research and Development Expenditures	8,284,000	8,733,000	— 5.1%
Facility Additions:			
Capital Expenditures	32,200,000	49,900,000	—35.5%
Leased Facilities	1,600,000	2,000,000	—20.0%
Total Assets (less applicable reserves)	583,305,000	564,583,000	+ 3.3%
Stockholders' Equity	268,235,000	255,747,000	+ 4.9%
Book Value Per Share	22.99	22.23	+ 3.4%
Shares of Common Stock Outstanding at End of Year	11,668,404	11,503,582	+ 1.4%
Number of Stockholders at End of Year	45,457	50,783	—10.5%
Number of Employees at End of Year	12,251	12,709	— 3.6%

Operating results stated above are from Continuing Operations. The net operating results are before extraordinary charge to income arising from discontinued operations.

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EX-176-C

Executive Offices: 150 East Forty-Second Street, New York, New York 10017 / Telephone: (212) 682-6700

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[illegible] Financial Section

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Annual Meeting April 26, 1972

Airco stockholders are cordially invited to attend the 1972 Annual Meeting at 10 A.M. on Wednesday, April 26, 1972. The meeting will be held in the Windsor Suite on the lobby floor of the Hotel Commodore, 109 East 42nd Street, New York City. Formal notice of the Annual Meeting, Proxy and Proxy Statement are included with this Report (see back cover).

Corporate Data

GENERAL COUNSEL
Shearman & Sterling
53 Wall Street
New York, N.Y. 10005

AUDITORS
Haskins & Sells
2 Broadway
New York, N.Y. 10004

TRANSFER AGENT
First National City Bank
111 Wall Street,
New York, N.Y. 10005

REGISTRAR OF STOCK
Morgan Guaranty Trust
Company of New York
23 Wall Street
New York, N.Y. 10005

STOCK LISTING
New York Stock Exchange

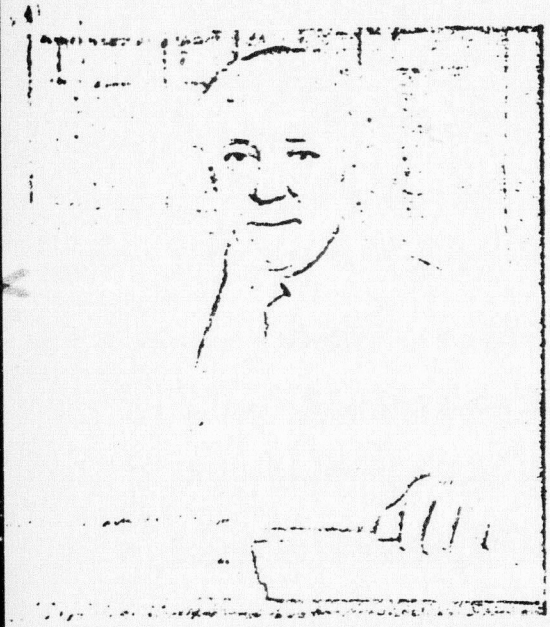
TICKER SYMBOL AN

A4598

Chairman's Review

March 10, 1972

CX-174-D



To Our Shareholders:

1971 was a very unusual and difficult year for most broadly based businesses. The United States economy and industry suffered from a frustrating combination of a business recession coupled with inflation and major shifts in the Government's economic, monetary and trade policies.

Despite this generally adverse economic environment, we were able to achieve a modest increase in both our sales and earnings performance as compared with 1970.

Sales and Earnings

Net sales for 1971 were $440.6 million, $4.1 million higher than sales of $436.5 million for the previous year.

Net income after taxes for 1971 was $19.1 million, or $1.64 per share, an increase of four cents per share, as compared with 1970 net income of $18.3 million, or $1.60 per share, from continuing operations.

Our earnings performance in the last three months of 1971 advanced about 80 per cent over the third quarter. This improvement reflected a slight upturn in two of Airco's principal markets, steel and durable goods, as well as a rigorous company-wide cost reduction program. In 1971, earnings also included a modest increase in investment tax credit, which was eight cents per share, versus six cents per share in 1970.

Divisional Achievements

Outstanding performances were achieved by several Airco divisions, including Speer Carbon-Graphite, Ohio Medical Products, Industrial Gases and BOC Argentina. The sales and earnings achievements of all of Airco's 10 divisions are summarized in the "Operating Performance Review" (pages 4 to 8 in this Annual Report). Also, 1970-71 sales and earnings comparisons of our five major product groups are detailed on page 20.

Facility Additions

During 1971, expenditures for facility additions were $33.8 million, down substantially from the $51.9 million invested in 1970.

Research and Development

Our research and development expenditures were reduced too, from $8.7 million in 1970 to $8.3 million in 1971. We also reorganized our research and development programs to insure that they either were attuned more closely to specific divisional needs or had very promising and reasonably attainable commercial potential.

Major Organizational Changes

On December 22, 1971, Robert H. Legg, Chairman and Chief Executive Officer of Uris Buildings Corporation, was elected a Director, succeeding Keith S. McHugh, who had served with distinction as a Director since 1944.

Several major changes were made in our senior management group in the last quarter of 1971 and the first two months of 1972. At the Board of Directors meeting held November 24, 1971, I was elected Chairman and Chief Executive Officer; Richard V. Giordano, 37, who had been a corporate Group Vice President, was elected President, Chief Operating Officer and a Director; and David J. Craig, 46, previously Vice President, Corporate Planning, was elected a Group Vice President.

In February, 1972, Donald Reich, 50, who had been Vice President, Administration, was named Vice President, Finance and Law, succeeding David H. Lyall, 63, who will continue as a Vice President of the company. Walter J. Naber, Jr., 53, who had been Assistant Treasurer of Monsanto Company, joined Airco in February and was elected Treasurer, succeeding Henry M. Koster, 64, who will retire this year. Gordon J. Arquette, 46, previously Director, Science and Engineering, was appointed Director, Corporate Planning and Development, and will continue to have reporting to him the Corporate Research and Development Laboratories.

Impact of Government's New Economic Policy

We are cooperating fully with the letter and the spirit of President Nixon's program to control inflation and restore a strong and growing national economy. As our part of the program, we have agreed to limit price increases on our products during 1972 to an average of 2 per cent measured on an overall corporate basis.

Airco has made substantial internal progress in reducing expenses and increasing productivity, and

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we will maintain our efforts to do so in 1972. However, these gains will be more than offset by continuing increases in costs for labor, transportation, coal, electric power and other raw materials unless the Wage Board and the Price Commission succeed in controlling wages and the prices of the goods and services that make up major segments of our costs.

We recognize the Government's goal of controlling inflation is difficult to achieve. We believe it can be accomplished, but only if business, labor and the general public insist that the Wage Board and the Price Commission act in a diligent, fair-minded and responsible manner.

Outlook for 1972

If the President's program succeeds in bringing inflation under reasonable control and the economy is revitalized, we believe our 1972 sales and earnings performance will show significant improvement.

Once again, we wish to thank our stockholders, distributors and customers for their continued interest and support in 1971. We particularly want to express appreciation to our employees for their understanding and cooperation during a most difficult year.

George S. Dillon

GEORGE S. DILLON
Chairman

Air and the Environment—a Progress Report

Airco made significant progress during 1971 and the early months of 1972 in meeting state and federal environmental regulations. For example, at:

Niagara Falls, New York We started up a $2.1 million baghouse filter system on a ferroalloy furnace there in June, bringing it into compliance with all environmental standards. We also made improvements on air pollution-control equipment at our electrode graphitizing operations.

Charleston, South Carolina We finished construction of a second 35,000-kilowatt ferroalloy furnace, incorporating the latest pollution-abatement equipment. Both furnaces, costing more than $17 million, were built to replace five older furnaces solely in the interest of a cleaner environment. They have been tested and recently certified by the South Carolina Pollution Control Authority as being in complete compliance with its environmental regulations.

[illegible] We completed a $200,000 modification program to increase the efficiency of a high-energy wet scrubber in collecting particulate [illegible] from the new ferroalloy furnace to meet [illegible] pollution-control regulations.

[illegible], Pennsylvania We started up a new [illegible] incinerator at our carbon baking facilities. The [illegible] of this installation is assisting us in developing [illegible] abatement equipment for our other [illegible] operations.

[illegible] We received [illegible] approval from [illegible] Air Pollution Control [illegible] for [illegible] program costing at least $1 million—which will result in a 99 per cent reduction in air pollution from our operations by 1975. The first step in this program—a baghouse filter system—has already been completed. The overall program is somewhat behind schedule due to a variety of factors, including a construction strike and late delivery of some equipment. However, we will make up a major portion of this delay over the next several months and be in full compliance, as scheduled, in 1975.

Vargon, Sweden We will bring on-stream in June, 1972 a new 40,000-kilowatt ferroalloy furnace costing $8 million, including over $2 million for air pollution-control equipment. We also spent about $800,000 to install controls on two older furnaces. The Swedish Government subsidized 25 per cent of the costs for pollution-abatement equipment for the three facilities, which will be in compliance by mid-1972. Currently, we plan to spend an additional $1.4 million for equipment on three other smaller furnaces, and 75 per cent of this expense will be subsidized as part of that country's program to insure a clean-air environment and to provide additional employment. The completion of these three furnaces, by the end of 1972, will bring our entire Vargon facility into full compliance.

Airco believes these major and very costly programs convincingly demonstrate that we are successfully meeting the strong commitment we made in our 1970 Annual Report "to operate our facilities in a manner that will provide a clean, wholesome and attractive environment for Airco employees and other persons living in our many plant communities."

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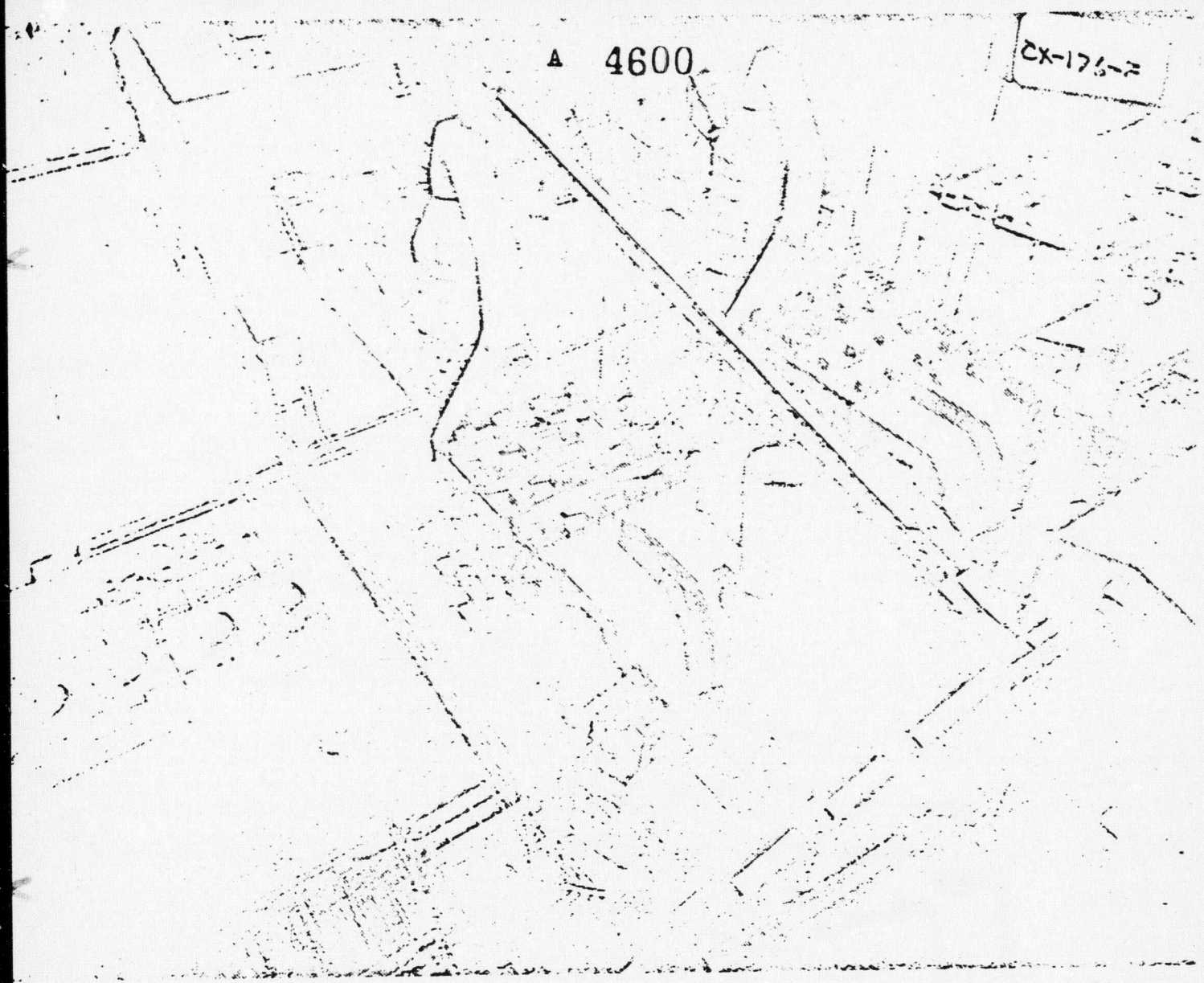

Airco Alloys and Carbide Division

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A 4601

Alloy sales up 4% domestically but down 5% worldwide; earnings ware off substantially

Although sales of ferroalloys increased by a small amount domestically, they were down five per cent worldwide. The earnings of this division were down appreciably, reflecting a low level of production in the steel industry, both here and abroad, during the second half of 1971. Earnings were penalized also by intense price competition and by significantly increased costs for raw materials, especially power.

It was a very difficult and abnormal year for the division, as a result of bringing on new facilities and contending with a very irregular market pattern. In the first several months, steel users built up a 12-million-ton stockpile as a hedge against a strike. When the strike did not materialize, and the economy also sagged, steel industry production dropped drastically, and the sales and prices of ferroalloys also declined sharply.

Two new furnaces on-stream. In late summer, the second 35,000-kilowatt ferroalloy furnace was completed and started up at Charleston, South Carolina. This unit, like the first, is equipped with the most modern pollution-control equipment available. The furnace at the Mobile, Alabama facility, purchased in late 1970, began operating in January, 1971, and is the only totally enclosed ferroalloy production unit operating in the United States. Both the Charleston and Mobile facilities have easy access to the ocean, providing significant in porting and exporting advantages.

Swedish expansion nearing completion. Construction of the new 40,000-kilowatt ferroalloy furnace in Vargon, Sweden, is proceeding on schedule, and is slated for start-up in June, 1972. The new furnace will replace part of the existing facilities operated by the company's subsidiary, Airco Alloys AB, and will give the division much more efficient production facilities and a more substantial base of operations in Europe.

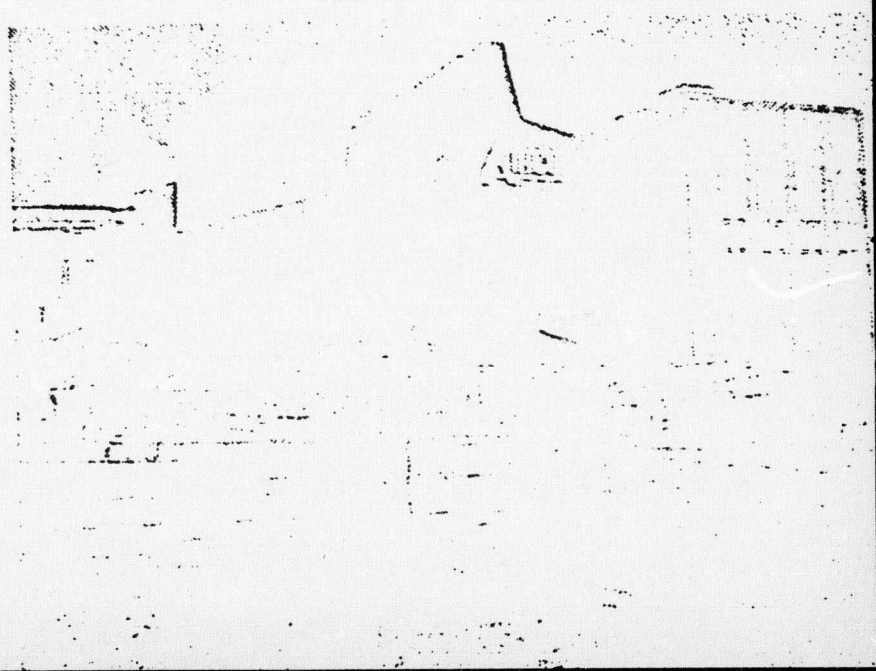
Carbide sales and earnings declined. The generally soft economy, especially in the chemical industry, resulted in a sharp decline in sales of acetylene and calcium carbide, the two major products manufactured by the carbide segment of the division. Accordingly, both sales and earnings were adversely affected.

Products: Alloy pig iron, ferrochromium, ferrochrome silicon, ferrosilicon, silicon metal, standard ferromanganese, low-carbon and medium-carbon ferromanganese, manganese silicide, silicomanganese, stainless steel pigs, special alloys and metals, calcium carbide and acetylene, quicklime and hydrated lime.

Plants: Calvert City, Ky. (2); Charleston, S.C.; Louisville, Ky.; Mobile, Ala.; Niagara Falls, N.Y.; Vargon, Sweden (Airco Alloys AB).

Alloy Markets: Steel, automotive, foundry, aluminum, miscellaneous metals.

Carbide Markets: Chemical, welding and cutting, construction, waste-water and mine drain-water treatment and steel mill waste neutralization.



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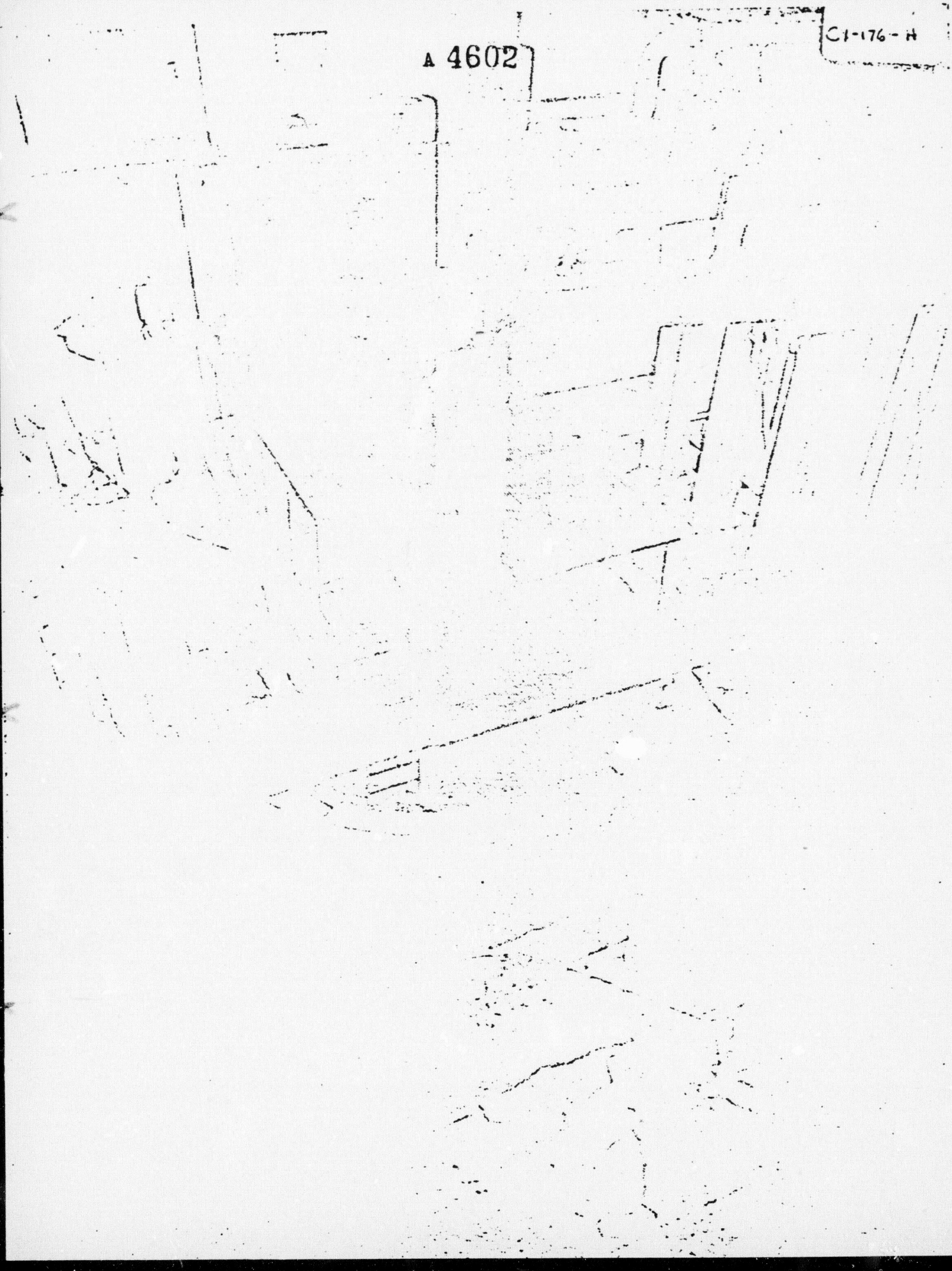

Airco Speer Carbon-Graphite Division

A 4603

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Record highs attained in sales, up 11%, and earnings on strong demand for graphite electrodes

In 1971, the Airco Speer Carbon-Graphite Division registered all-time highs in sales and earnings for the fourth consecutive year. A major portion of the 11 per cent sales advance was attributable to the increased orders for the division's premium-grade graphite electrodes by the electric steelmaking industry during the first half. The reduced market demand in the second half, caused by the slowdown in domestic steel operations, was partly counterbalanced by increased shipments to Europe, India and South Africa.

Electrode market offers sharp growth. Sales of graphite electrodes, the largest portion of the division's business, are geared to the amount of steel produced in electric furnaces, which has increased dramatically because of inherent capital investment and operating economies. In 1971, these furnaces produced 21 million tons of steel, a figure expected to almost double over the next ten years.

Other products fared well despite sales drop. The economic downturn had an adverse effect on sales of products other than electrodes, but earnings improved in most lines, which included graphite anodes for producing chemicals and magnesium, carbon brushes for motors and generators, gouging rods for cleaning steel castings, electrodes for electrical discharge machining, and machined graphite specialties. The favorable profits in these product groups were attained by improved operating efficiencies and a high degree of market selectivity.

Products: Threaded graphite electrodes for steelmaking; anodes for electrolytic production of chemicals and metals; brushes for motors and generators; electrodes for electrical discharge machining; graphite welding and gouging rods; carbon battery electrodes; machined carbon and graphite molds, fixtures and specialties.

Plants: Niagara Falls, N.Y.; Punxsutawney, Pa.; St. Marys, Pa.; Montreal, Canada (Speer Carbon Co. of Canada Ltd.).

Markets: Steel, foundry, electrochemical, nonferrous metals, quartz, refractories, automotive, railway, aircraft and aerospace, manufacturers of dry cell batteries, Federal Government.

Left: The [illegible] graphite electrode [illegible] aluminum in Portland Steel Company's electric steelmaking [illegible] at Steelton, [illegible]. Electrodes [illegible]

Right: [illegible]

Airco Temescal Division

A 4604

CX-176-3

...developments and cost reduction program ... division sales 16%, improved profits

The market success of the Airco Temescal Division's unique coating element for coating jet engine blades and vanes, combined with a stringent cost reduction program, resulted in a 16 per cent sales increase and a turnaround from a loss in 1970 to appreciable profits last year.

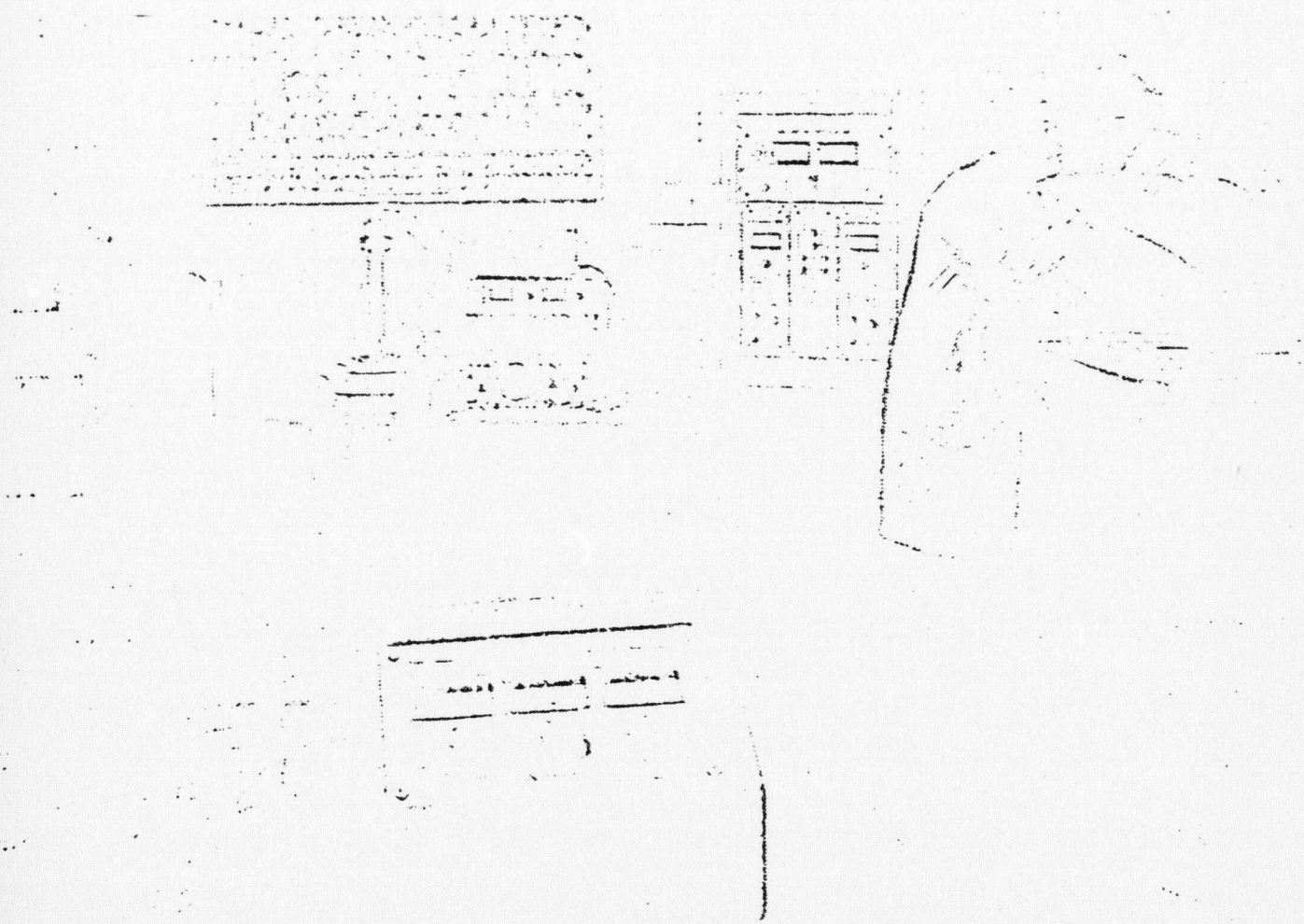
...ades for coating jet engine parts ... very successful. Airco Temescal's revolutionary process for coating jet engine vanes and blades provides the aircraft industry with two major cost-saving advantages: longer service life and greater fuel-burning efficiency.

...from subsidiary effectively ... The division's recently formed subsidiary, Airco Temescal N.V., completed its first full year with a firmly established foothold in the European vacuum equipment market. Sales were particularly strong in France, Germany, Great Britain, Sweden and the Netherlands.

Products: Integrated high-vacuum electron-beam (EB) systems and components, high-vacuum valves, turbo-molecular and titanium sublimation pumps, power supplies, EB guns and related monitoring equipment, transformers, processing of special materials in EB furnaces, thin-film production systems, coating systems for decorative and functional plating, bell jar and fast-cycle coaters and sputtering modules.

Plant: Berkeley, Calif.; warehouse in Amsterdam, the Netherlands (Airco Temescal N.V.).

Markets: Steel, alloys, electronics, optical, aircraft, glass, automotive, Federal Government.



General view of Airco Temescal's new customer applications laboratory in the division's plant at Berkeley, California.

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[illegible] problems resulted in low sales and a [illegible]; performance improved at year-end

During the first half of 1971, production difficulties continued to impede operations at the Airco Vacuum Metals Division's new Electron Beam Hearth Refining facility. By mid-year, production capability had improved sufficiently to permit a significant test of the market. During the latter half of 1971, the division produced and arranged for the conversion of approximately 1,500 tons of E-Brite 26-1 into a wide variety of standard mill forms—sheet, strip, bar, billet and wire, and stock suitable for fabricating pipe and tubing. Inventories are now starting built up in selected steel service centers throughout the country.

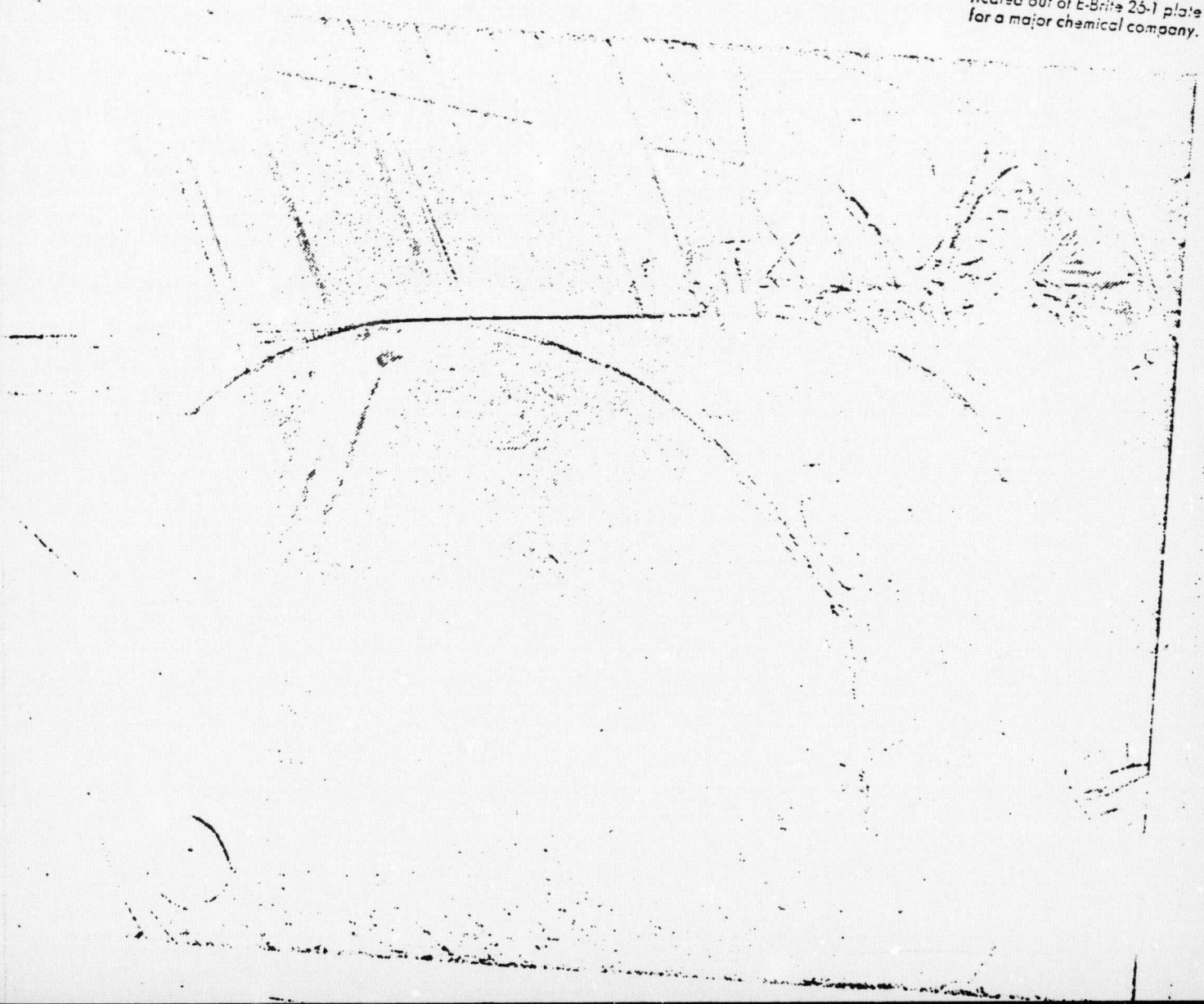
E-Brite 26-1 uses grow. Because of E-Brite's superior corrosion resistance, interest in the product by the chemical process, petroleum refining, pulp and paper, food processing, marine and power industries continued to grow impressively. The revolutionary alloy has met the stringent requirements of the ASME Boiler and Pressure Vessel Code which opens the way for E-Brite's use in heat exchangers, evaporators and tanks.

Products: Electron-beam hearth refined stainless and special products in the form of cast slabs and blooms, sheet, strip, bar, billet, wire and stock suitable for converting into tubing and pipe.

Plant: Berkeley, Calif.

Markets: Chemical process, petroleum refining, pulp and paper, power, desalination and water treatment, shipbuilding and marine, food processing.

Large digester tank being fabricated out of E-Brite 26-1 plate for a major chemical company.



Airco Viking Division

A 4606

CX-174-L

[illegible] sales, up 10%, and profits set new records; major plant expansion program nears completion

[illegible] through the markets for turbine engine rings and other forged metal products were sluggish, the Airco Viking Division increased its sales penetration into these areas, leading to record sales and earnings for 1971.

[illegible] plant facility underway. The division's modern plant in Verdi, Nevada, is being expanded by 30,000 square feet to produce a new line of metal extrusions and a diverse cross section of industrial bars. These new extrusion facilities will increase the production capacity of the plant by 60 per cent, and will broaden Airco Viking's product line. Completion is scheduled for mid-1972.

New equipment installed in West Coast plant. New precision machinery was installed in the Albany, California facility to manufacture prototype and start-up custom-rolled and swaged-bar exotic metal products.

Products: Seamless roll forged rings, press and hammer forgings, extrusions and extruded type forgings, crane mill parts, custom rolled and swaged bar—produced in titanium, nickel base and refractory alloys, stainless steels, aluminum, alloy steels and copper alloys.

Plants: Albany, Calif.; Verdi, Nev.

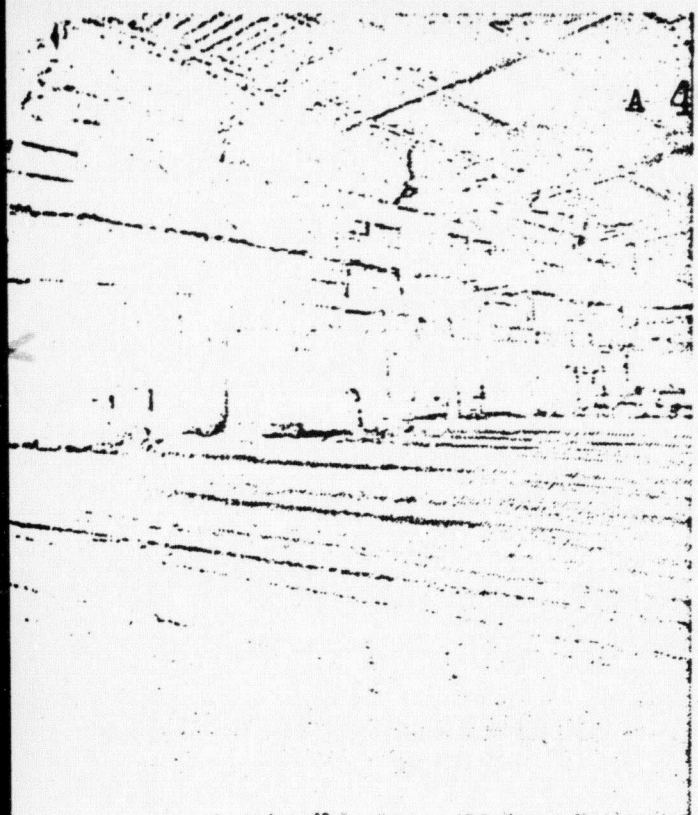
Markets: Gas turbine, aerospace, machinery, electronics, petrochemical, nuclear.

The Sierra Nevada Mountains serve as a backdrop for Airco Viking's plant in Verdi, Nevada. Left half of high building is expansion portion nearing completion.

A 4607

Airco Speer Electronics Division

EX-176-H



Sales up 7%, earnings improved in fourth quarter as new plant operated at close to full capacity

Strong foreign competition and price attrition continued to characterize the passive components segment of the electronics industry during most of 1971. Even though the import surcharge had a serious negative effect on shipments to the United States from the major new plant in Singapore, the Airco Speer Electronics Division attained a seven per cent increase in sales. The division operated at a loss for the full year, but showed a modest profit in the fourth quarter.

Singapore plant nearing full capacity
Airco Speer's new electronic resistor plant in Singapore has been fully operational since early 1971, and this modern facility has greatly enhanced the division's competitive position worldwide. Substantial foreign shipments were made from this plant to customers located in Korea, Taiwan, Hong Kong, England, Canada and Singapore. Construction of a 50,000-square-foot addition is being completed and will expand the capacity by one-third.

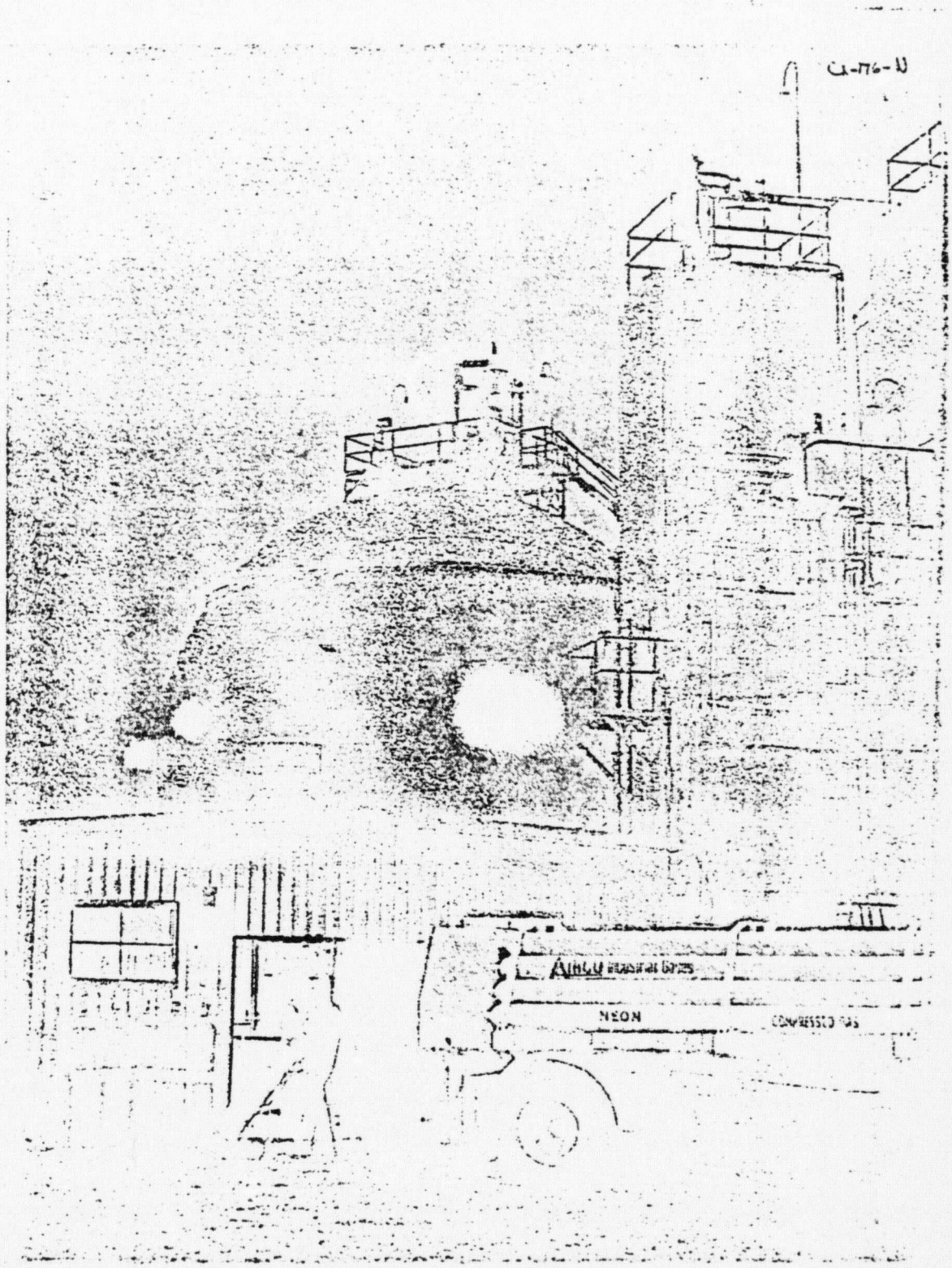
Products: Fixed composition resistors and capacitors, radio frequency choke coils, cermet pastes.

Plants: Bradford, Pa.; Nogales, Mexico (Airco de Mexico S. A. de C. V.); Singapore (Airco Singapore Pte., Ltd.).

Markets: TV and radio, electronic data processing equipment, industrial instruments, military electronic apparatus.

Top: Electronic resistors are [illegible] in [illegible] ovens in the Singapore plant.
Bottom: Newly developed [illegible]

A 4608



Airco Industrial Gases Division

CX-17-C

A 4609

Sales up only slightly; more stable pricing and new marketing strategy boosted earnings

Although sales were up only slightly in 1971, the Airco Industrial Gases Division substantially increased its earnings for the second straight year. This outstanding performance was achieved by the combination of more stable pricing and a new division-wide marketing strategy aimed at decisively improving profitability. The division made an intensive study of all current and potential major customers, their sales volume, product mix, special requirements, distance from Airco plants and other pertinent data. This input enabled the division to exercise selectivity based on the profitability of customer accounts, and to reduce distribution costs significantly.

European helium joint projects formed Last June, the division negotiated two agreements for the sale of helium in Europe, one with L'Air Liquide of Paris, France, and the other with Messer Griesheim, G.m.b.H. of Dusseldorf, West Germany. These new arrangements, combined with the division's Japanese helium joint venture formed in late 1970, have established Airco as the world's largest commercial supplier and marketer of helium. The product is shipped overseas as a liquid in specially insulated 8,500-gallon containers.

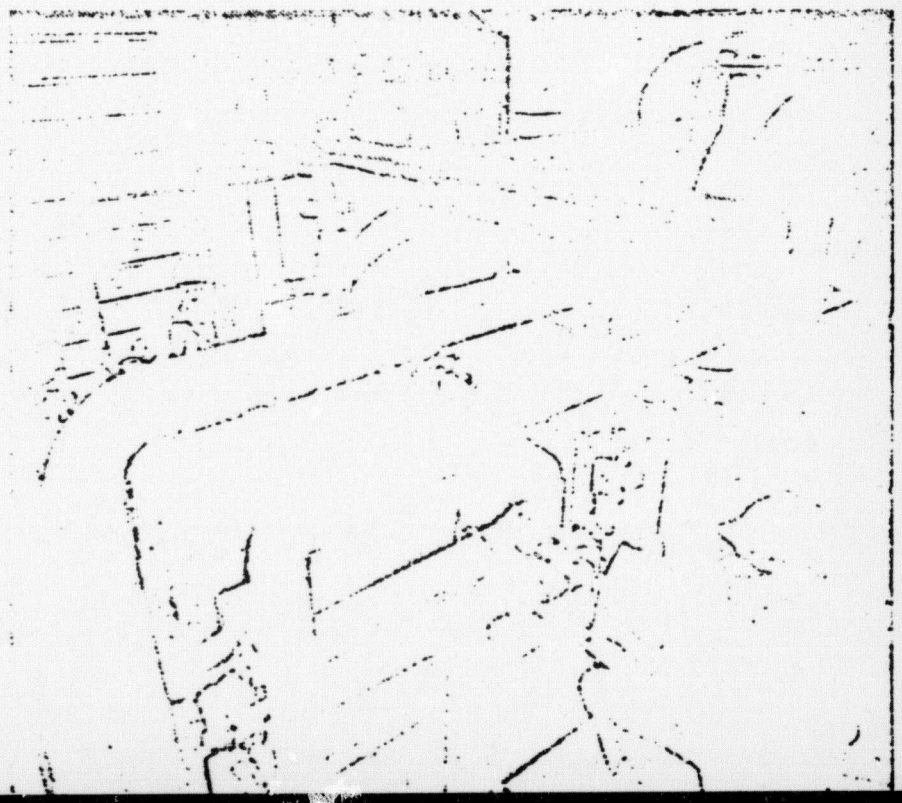
Construction subsidiary established Last October, following the termination of Airco/BOC Cryogenic Plants Corporation, a 50-50 joint venture with British Oxygen Company (BOC), Airco continued to market, design and construct low-temperature plants under a new domestic subsidiary, Airco Cryoplants Corporation. This company will exchange technical information with, and purchase low-temperature components from, BOC. Airco Cryoplants is currently building two 400-ton-per-day oxygen plants for U.S. Steel's Fairless Works in Pennsylvania, and four liquefied natural gas plants for utilities on the East Coast. These contracts total approximately $30 million in sales.

New carbon dioxide plant completed Last month, a new fully automated carbon dioxide (CO_2) plant came on-stream in Lawrence, Kansas. The facility will supply the product to carbonated beverage bottlers and food freezing firms in Kansas, Nebraska, Oklahoma and Colorado. Contributing strongly to increased CO_2 sales were three food freezing and preservation processes developed by Airco in recent years: Sky-Cold for the refrigeration of food at airports and aboard jetliners; KwikFreeze for production freezing of meat, bakery products, poultry and seafood; and Dri Pack for freeze-packaging of meat, fish and poultry.

Products: Oxygen, nitrogen, argon, hydrogen, helium, carbon dioxide, rare gases (krypton, neon and xenon), cryogenic fluids and related equipment.

Plants: Fifteen on-site industrial gas and cryogenic fluid, two carbon dioxide, one liquid hydrogen, one rare gases, one gaseous hydrogen and four liquid helium conversion plants.

Markets: Iron and steel, nonferrous metals, chemical, food and beverage, electronics and electrical equipment, machinery, aerospace, metal fabricating, automotive, air pollution, Federal Government.



Left: [illegible]

Right: [illegible]

A 4610

CX-176-P

Airco Welding Products Division

CY-176-Q

A 4611

[illegible] were down 2% and earnings declined, reflecting [illegible] to the recession and a 14-week strike at wire plant

[illegible] downturn in the capital goods segment of the economy, during the second and third quarters precipitated a two per [illegible] for the Airco Welding Products Division. Gas sales and earnings moved upward slightly, but the welding equipment and filler-metals sales and earnings were significantly below the previous year. In addition, earnings were affected negatively by a strike of three and a half months at the division's welding wire plant in Chester, West Virginia.

[illegible] a program highly effective In September, 1971, the division introduced an aggressive cost reduction program at all operating levels, resulting in an immediate improvement in earnings. Assisted by a gradual upturn in the capital equipment [illegible], sales and earnings improved during [illegible] quarters and this performance [illegible] continued into early 1972.

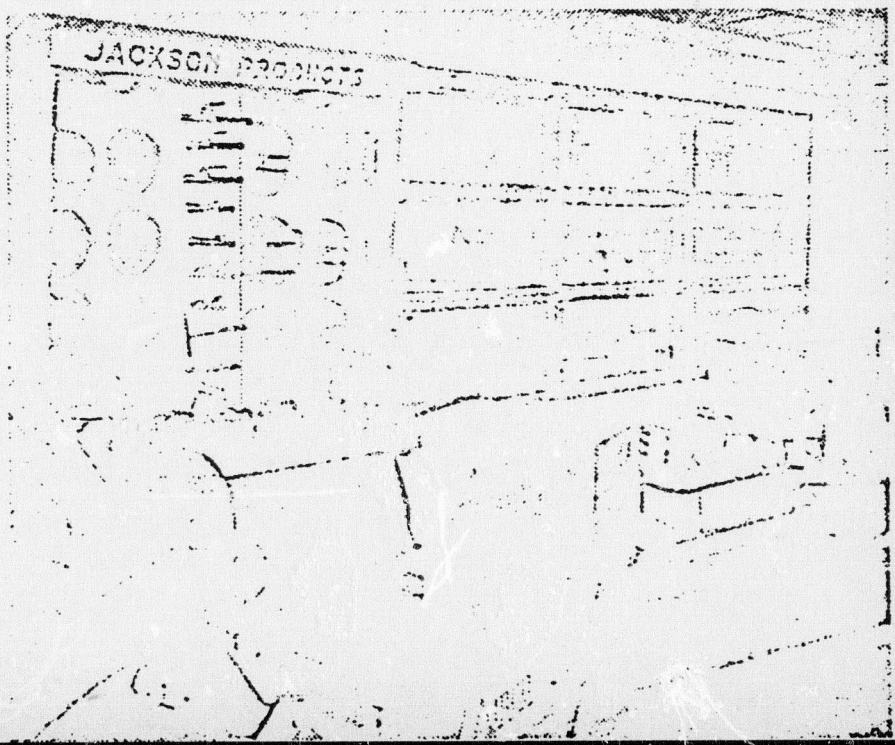
[illegible] Products Department The division's Jackson Products Department, which produces an extensive variety of safety accessories, including welding helmets, gloves, electrode holders and [illegible] hard hats, completed 1971 with appreciable increases both in sales and profits. Jackson's highly regarded line is marketed through the broadest network of distributors in the industry.

Business assistance offered distributors A recently formed Distributor Development Department increases the division's support to its 300 authorized welding distributors. Special advice and counsel are now available in general business areas such as data processing, financial analysis, distribution systems and marketing programs. These services are in addition to the traditional sales and technical backup Airco provides its distributor organization.

Products: Oxyacetylene, oxy-MAPP, arc welding and inert gas-shielded arc welding and cutting equipment; power sources; electrodes and wires; Jackson arc welding accessories and safety equipment, cylinder gases and gas regulators; Aronson positioners, turning rolls and vibratory stress relieving equipment.

Plants: Arcade, N.Y.; Chester, W. Va.; Cleveland, Ohio; Sparrows Point, Md.; Union, N.J.; Warren, Mich.; 27 acetylene generating plants.

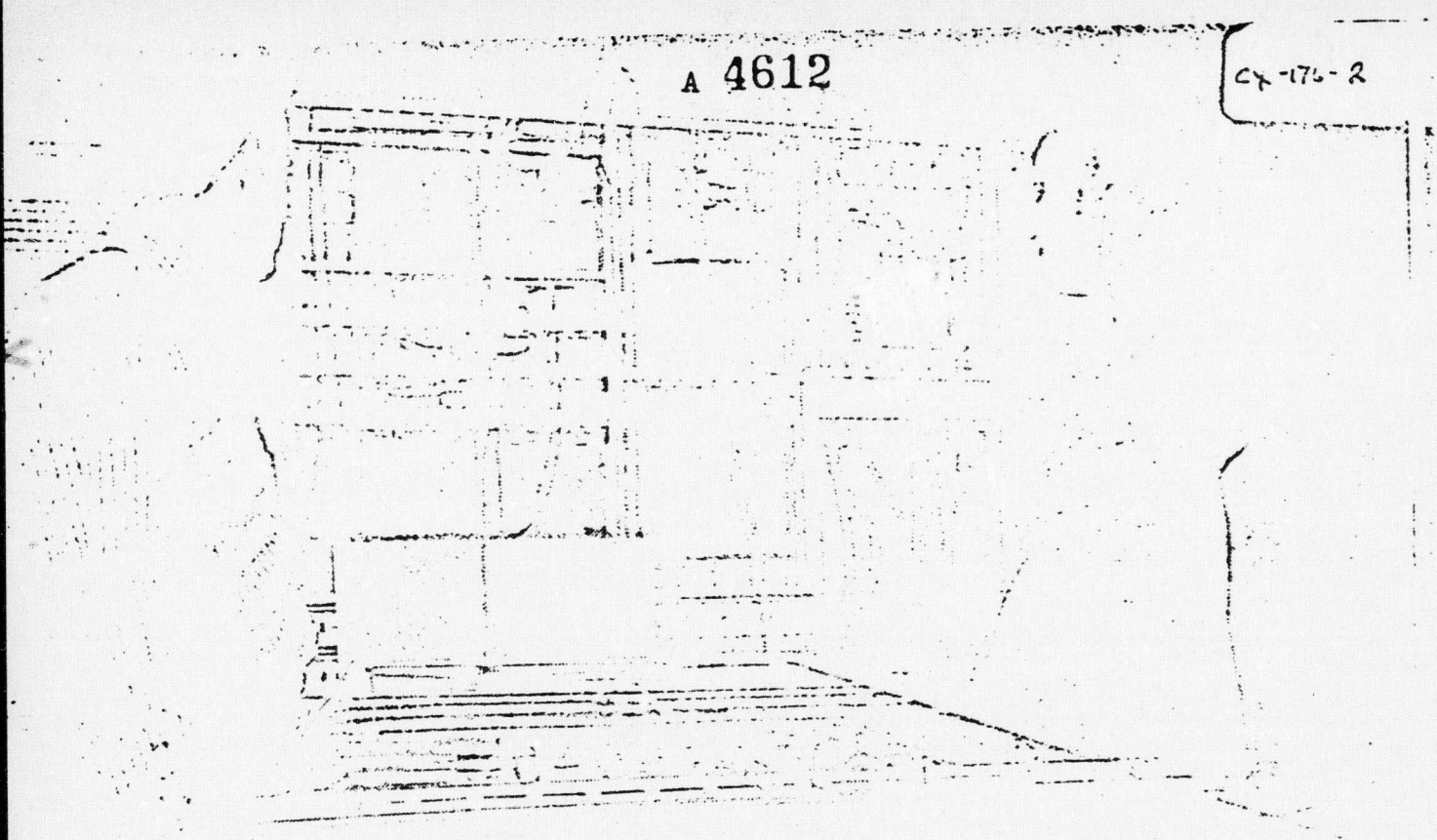
Markets: Machinery and appliances, railroad and shipbuilding, metal fabricating, automotive, iron and steel, electrical equipment and electronics, aircraft and aerospace, Federal Government. These markets are served mostly through a nationwide network of several hundred franchised domestic distributors and company-owned Sales & Service Centers.

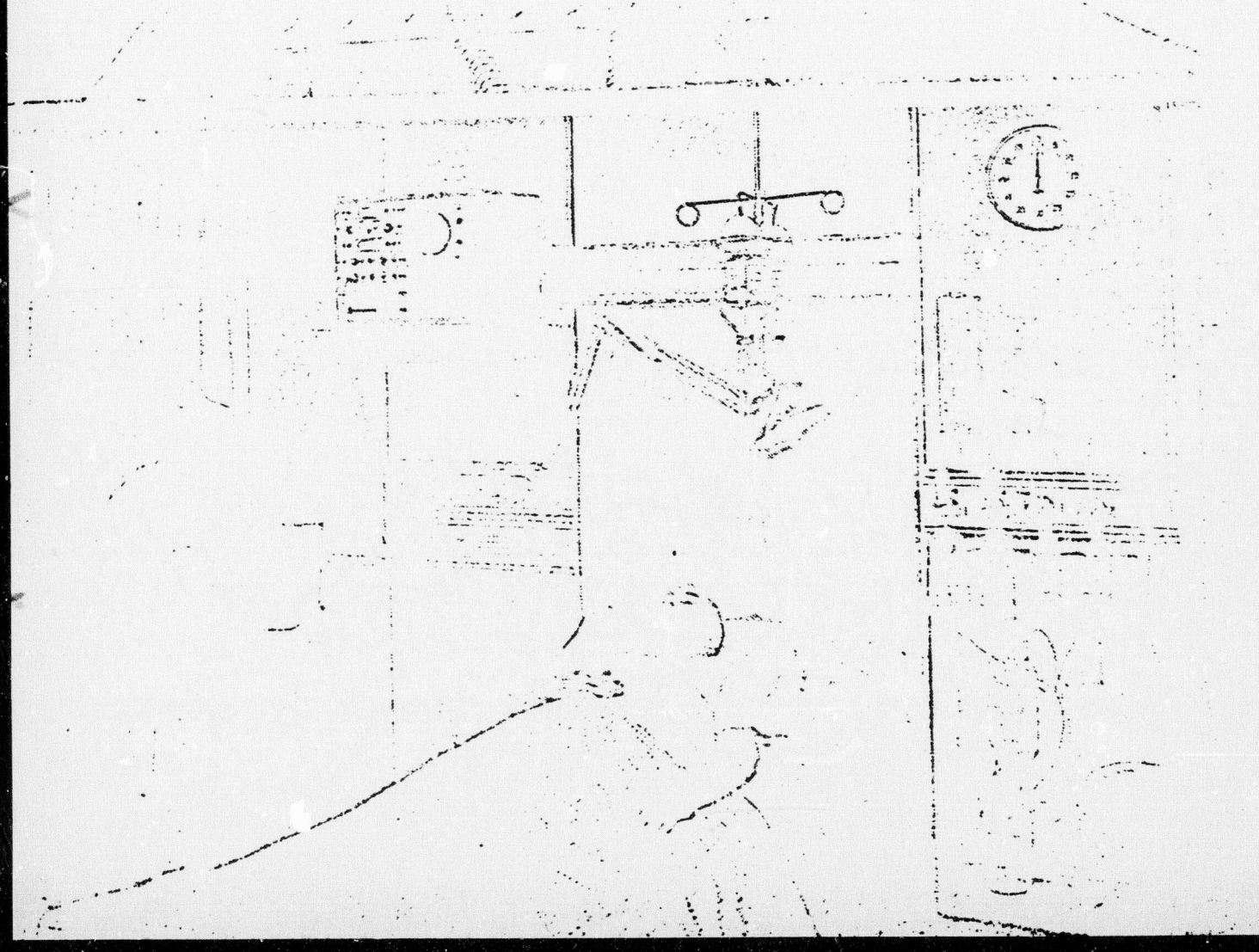


Left: [illegible]

A 4612

Cx-176-2





Ohio Medical Products Division

A 4613

CX-176-5

Strong growth in equipment sales, production efficiencies raise division sales, up 26%, and earnings to new highs

Record sales were again achieved by the Ohio Medical Products Division. The major contributing factor to the overall 26 per cent increase in revenues was the strong sales growth in equipment—including anesthetic, respiratory care and pediatric equipment, hospital pipeline systems and the newly acquired line of modular wall units for intensive patient care.

The surge in earnings was due mainly to higher sales volume, as well as increased production efficiencies made possible by the new facilities completed in 1970 at Madison, Wisconsin.

Wall-rail Systems extends product line

In early 1971, Ohio Medical acquired Electro/Systems, Inc., a Richmond, California designer and manufacturer of modular MultiWall systems used in the building and remodeling of patient rooms as well as suites of facilities—including intensive and coronary care areas. Prefabricated in sections, these systems are designed for job-site installation as a single unit, and include specially tailored arrangements of pipeline and electrical outlets, lighting and vacuum bottle shelves—all vital to proper patient treatment. Electro/Systems' equipment has proved an ideal complement to Ohio's product line, and has found excellent market acceptance.

New single-use items showed solid sales growth

Several new disposable products, including endotracheal tubes and airways for administering anesthetics and for respiratory care, were added to the division's growing list of single-use items. Both products, introduced in 1971, made significant contributions to the division's total sales of disposables.

Demand continued for diagnostic units

Further sales gains were attained for Ohio's line of computer-oriented pulmonary function testing devices. Added to the line in 1971 was the plethysmograph system used to measure certain lung function parameters important in diagnosing respiratory disorders.

Other equipment sales advanced

Notable also was a substantial increase in sales of pediatric equipment due mainly to the modernization and development of pediatric intensive care centers located strategically throughout the country. Another item, Hand-E-Vent II, a second generation of Ohio's intermittent positive pressure breathing device for pulmonary disorders, also received rapid acceptance during the year. The new design increases the versatility of the unit, while maintaining its simplicity, ease of use and durability.

Products: Anesthetic agents and medical gases, anesthesia apparatus and accessories, inhalation therapy and resuscitation equipment, hospital pipeline systems, infant incubators, respirators, cryosurgery equipment, pulmonary function testing equipment, modular wall systems for special patient care areas.

Plants: Berkeley, Calif.; Cleveland, Ohio; Fort Myers, Fla.; Houston, Tex.; Lodi, N.J.; Madison, Wis.; Richmond, Calif.; Toronto, Canada (Ohio Medical Products Canada).

Markets: Hospitals, clinics and nursing homes; medical and dental professions.

Top Left: *MultiWall system, part of Ohio's newly acquired line, is being installed at [illegible] Presbyterian [illegible] New York City. [illegible] has completed [illegible] for patient [illegible] care [illegible] plethysmograph [illegible] lung function parameters [illegible] only with*

Airco Cryogenics Division

CX-176-T

A 4614

Cryogenic equipment sales surged upward 59% with earnings rate, establishing new highs

Record sales and earnings were achieved by the Airco Cryogenics Division as a wide range of recently introduced products found strong acceptance in the marketplace. Major contracts were received for food freezing systems, liquefied natural gas turbocompressors and turboexpanders, jet aircraft starters, air conditioners, and a variety of pumps and mobile pumping systems for the petrochemical and industrial gas industries.

Increased sales also resulted from Cryogenic equipment, manufactured and marketed by the division's wholly owned subsidiary, Cryostar AG, based in Basel, Switzerland, also reported markedly improved sales to customers in Europe.

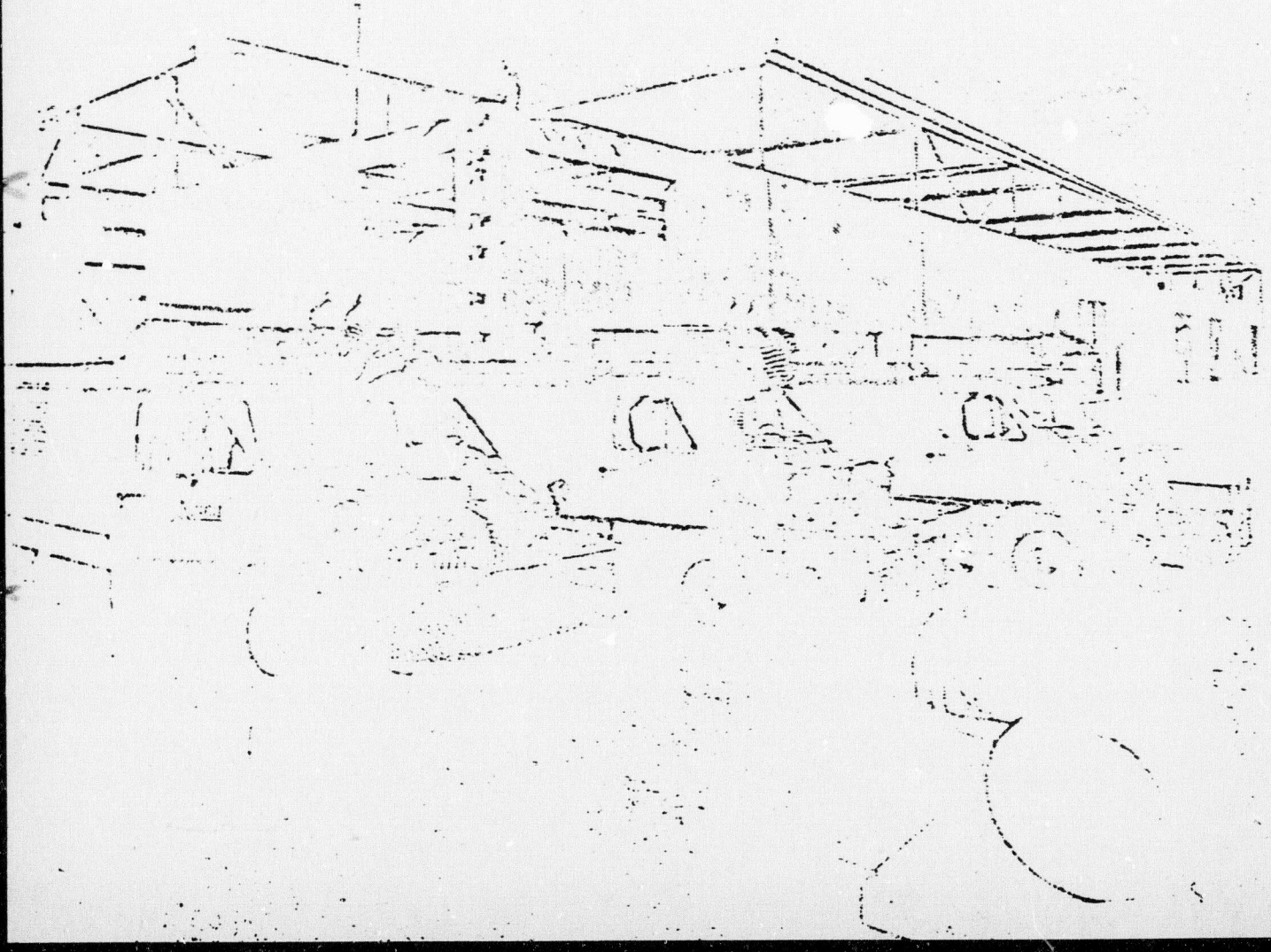
[illegible] expansion underway to meet [illegible]

A 50,000-square-foot addition to the five-year-old plant in Irvine, California, is scheduled for completion by mid-1972. This expansion will double the division's domestic manufacturing capacity.

Products: Cryogenic and mechanical equipment: high-pressure, centrifugal and submerged-motor pumps, turbines, turbocompressors and turboexpanders, high-performance electric motors and alternators; closed-cycle refrigerators, food freezing equipment, vaporizers and heat exchangers; life support equipment; carbon dioxide pelletizers; aircraft ground support equipment.

Plants: Irvine, Calif., Basel, Switzerland (Cryostar AG).
Markets: Industrial gas, food, liquefied natural gas, aerospace, electronics, research, petrochemical, shipbuilding and airlines.

Three jet aircraft starters, air conditioners, installed in trucks, undergo final inspection at the Irvine, California plant. New 50,000-square-foot addition to the plant is shown under construction in the background.



Employee relations and training

A 4615

CX-17-4

Pension plans were improved significantly; second Welding Training Center established

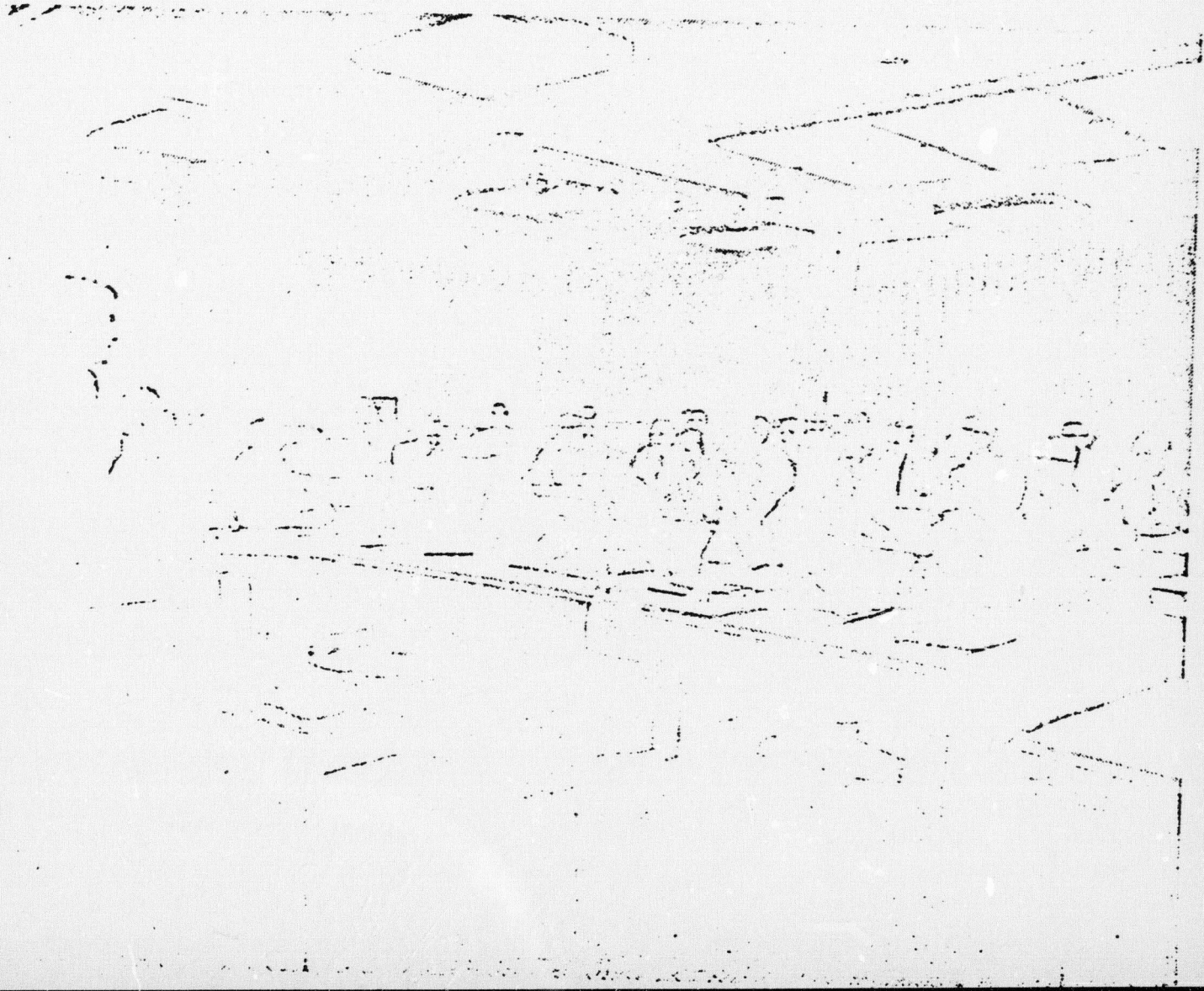
At the close of 1971, 12,251 office and plant personnel were employed by Airco in its domestic and foreign operations—a 3.6 percent increase compared with 1970. Of a total 119 labor contracts in effect, Airco negotiated 38 collective bargaining agreements, 34 of them without work stoppage. The four disputes were resolved satisfactorily. During 1971, the Manufacturing Chemists Association issued safety awards to 22 facilities for completing a full year without a disabling injury.

Pension plans improved Several improvements were made in the company's two pension plans—contributory and non-contributory—for salaried and non-union employees. The improvements bring these benefits to a level comparable to pensions negotiated for union employees.

Management program graduates 23 Airco's 1971 management training course, attended by 23 members of mid-management, stressed the role of the manager, management techniques, managing people and working effectivaly with others.

Second Welding Training Center opened In 1971, Airco began operating its second Welding Training Center to train the unemployed and veterans. Initially located at the former Brooklyn Navy Yard, the Center relocated to another section of Brooklyn to better serve industry throughout New York City. The other Center is in Cleveland, Ohio.

Airco President, Richard V. Giordano, outlines corporate and divisional policies and objectives at a meeting with the management teams from four of the company's divisions.



A 4616

CX-176-V

Sales and Income Before Taxes by Product Line*

(Dollars in Millions)

	Sales				Income Before Taxes			
	1971		1970		1971		1970	
	$	%	$	%	$	%	$	%
Ferroalloys & Carbide	132.9	30.2	140.0	32.1	9.6	29.2	12.0	38.2
Industrial Gases & Cryogenic Equipment	121.3	27.5	117.1	26.8	12.5	37.7	10.0	31.2
Welding & Cutting Equipment	71.0	16.1	79.6	18.3	1.8	5.5	3.5	11.0
Carbon, Graphite, Electronics & Metals	77.3	17.6	69.6	15.9	5.2	15.7	3.6	11.3
Medical Gases & Equipment	38.1	8.6	30.2	6.9	4.0	11.9	2.6	8.2
Total	440.6	100.0	436.5	100.0	33.1	100.0	31.9	100.0

Sales and Net Income Per Share by Quarter*

	Sales (Millions of Dollars)		Net Income Per Share	
	1971	1970	1971	1970
1st Quarter	$111.3	$109.8	$ .48	$ .46
2nd Quarter	112.7	110.7	.43	.42
3rd Quarter	103.1	109.1	.26	.40
4th Quarter	113.0	106.9	.47	.32
Total for the Year	$440.6	$436.5	$1.64	$1.60

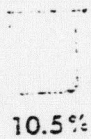
Where the Sales Dollar Went

Materials & Services	53.0¢
Payrolls	27.2¢
Depreciation	6.1¢
Taxes	5.7¢
Retained Earnings	2.2¢
Dividends Paid	2.1¢

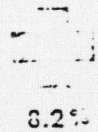
Sales to Industries

32.6%
Steel Mills & Foundries

13.8%
Machinery



10.5%
Industrial Chemicals

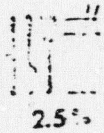


8.2%
Medical, Dental & Personal Care

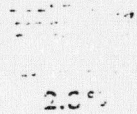
6.6%
Electrical Equipment & Electronics

5.2%
Trades & Services

3.9%
Aircraft, Space & Defense

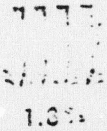


2.5%
Foods & Beverages



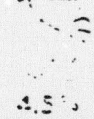
2.0%
Transportation (except Highway)

1.9%
Motor Vehicles



1.8%
Metal Fabricators

1.0%
Communications



4.5%
Other Industries

Statement of Accounting Policies

AIRCO, INC. AND SUBSIDIARIES

CA-175-W

A4617

The accounting policies followed by Airco in maintaining financial records and preparing financial statements are set forth below:

Principles of Consolidation The financial statements include the accounts of all significant domestic and foreign subsidiaries of Airco.

Inventory Pricing Inventories are valued at the lower of average cost or market.

Depreciation Methods Allowances for depreciation and amortization are accumulated generally on a straight-line basis. Alloys production equipment acquired after January 1, 1971 and electron-beam production facilities are depreciated on the units of production method.

Goodwill, Patents and Trademarks Goodwill is amortized on the straight-line basis over a period of 40 years. Patents and trademarks are valued at $1 for financial statement purposes; related costs are written-off in the year incurred.

Income Taxes Income taxes are provided in the year transactions enter into the determination of net income regardless of when such transactions are recognized for tax purposes. Accordingly, income taxes affecting payments in future years are included in Deferred Income Taxes. Investment tax credits are included as reductions of income tax expense in the year the credits arise.

Research and Development Costs Expenditures for research and development are charged to operations in the year incurred.

Translation of Foreign Currencies Current assets and liabilities of foreign subsidiaries are translated into U.S. dollars at the exchange rate in effect at the reporting dates. Long-Term Assets and Liabilities and Stockholders' Equity are translated at the rates of exchange in effect when acquired, incurred or issued.

Financial Review

A 4618

CX-176-X

Acquisitions and Dispositions In January 1971, Airco purchased substantially all of the outstanding stock of Electro/Systems, Inc., a manufacturer of multi-purpose hospital wall units, for a total consideration, including certain payments to creditors, of approximately $900,000 in cash. The operations of this company have been included in the consolidated financial statements from the date of acquisition.

During 1971, Airco issued 49,438 shares of its Common Stock in exchange for 100% of the outstanding shares of Jackson Welding Supply Co., an independent distributor of welding and cutting equipment, in a transaction accounted for as a pooling of interests. The operations of this company are included for the entire year 1971. As detailed in the Statement of Stockholders' Equity, the equity accounts of Airco were restated as of January 1, 1971 to give effect to the pooling of interests.

As of September 30, 1971, Airco and British Oxygen Company terminated the venture originally established in 1967 to market, design and construct low-temperature plants on a worldwide basis. Airco/BOC, the United States based portion of the venture, will now be operated as a wholly-owned subsidiary of Airco under the name Airco Cryoplants Corporation. The operations of Airco Cryoplants Corporation have been included in the consolidated financial statements from October 1, 1971.

In October 1971, Airco acquired, for a total of approximately $1,900,000, the remaining 50% of the stock in Cryostar A.G., a manufacturer of cryogenic equipment located in Switzerland. Operations of this company are included in the consolidated financial statements for the year 1971.

The operations, for the current and prior periods, of the companies mentioned above, are not material in relation to the consolidated net sales and net income of Airco.

In 1970 and early 1971, Airco sold the Chemicals and Plastics business and certain Canadian properties and also disposed of certain electronic product lines. The net results of these transactions were accounted for at the end of 1970 as set forth under Discontinued Operations and Extraordinary Items.

Foreign Operations At December 31 and for each year then ended, the net assets, sales and income of consolidated foreign subsidiaries were:

	1971	1970
Net Assets	$ 21,445,000	$ 17,016,000
Net Sales	$ 26,350,000	$ 23,014,000
Net Income	$ 2,184,000	$ 2,034,000

Inventories The Inventories at December 31 included:

	1971	1970
Finished Goods	$ 63,161,000	$ 47,241,000
Goods in Process	23,716,000	17,184,000
Raw Materials and Supplies	41,837,000	40,999,000
Total Inventories	$128,714,000	$105,424,000

Property, Plant and Equipment Capital expenditures during 1971 aggregated $32,200,000, down from the $49,900,000 spent in 1970. Depreciation and amortization amounted to $26,610,000 in 1971 and $25,350,000 in 1970, applicable to continuing operations. The change to the units of production method of depreciation for newly acquired alloys production facilities had no material effect on income for 1971.

Long-Term Receivables Long-Term Receivables include amounts due in connection with the disposition of property in 1970 and early 1971 which are to be collected over an eight-year period. The total amount of $9,600,000 has been discounted by $2,935,000 at December 31, 1971 and $3,512,000 at December 31, 1970, based on an imputed interest rate of 9.5%.

Long-Term Debt The amounts payable annually during the five-year period ending December 31, 1976 are as follows: 1972, $2,730,000; 1973, $19,042,000; 1974 $18,529,000; 1975, $18,502,000; 1976, $28,007,000. Subject to certain limitations and payment of premiums, prepayments on all long-term debt may be made.

Under a 1970 agreement, commercial banks are committed to lend $75,000,000 to Airco through December 31, 1972, of which $64,500,000 has been borrowed and is outstanding at December 31, 1971. The notes bear interest at ¼% above the best rate established, from time to time, by one of the participating banks, until December 31, 1972, and thereafter at ½% above the best rate in effect from time to time. At December 31, 1971, the rate of interest in effect was 5½%. Repayment of these notes is required to be made in equal semi-annual instalments over a five-year period beginning on June 30, 1973.

Notes payable to foreign banks, due in 1971, were refinanced as intended and therefore no amount was included in current liabilities at December 31, 1970. As a result of the refinancing, foreign banks are committed to lend an additional $5,000,000 until 1976.

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payments of cash dividends and the purchase, redemption, or retirement of Airco's capital stock. As of December 31, 1971, under the most restrictive of these provisions, the amount available for such expenditures was approximately $42,000,000.

Capital Stock Capital Stock of Airco consists of the following shares:

Class of Capital Stock	Shares Authorized	Shares Outstanding 1971	Shares Outstanding 1970
Preferred Stock, $1 par value	1,000,000	—	—
Common Stock, $1 par value, net of 17,963 shares in treasury	20,000,000	11,665,404	11,600,692

Common Stock reserved for issuance is as follows:

Reserved for	Shares Held by Trust	Shares Held by Others
Conversion of Debentures at $31.25 a share through 1987	1,016,334	1,016,334
Stock Option and Purchase Plans	297,359	368,340

Stock Option and Stock Purchase Plans Under Airco's stock option plans, shares of Common Stock have been made available to certain key employees of Airco at the fair market value at the date the options were granted.

A summary of option data for 1971 and 1970 is shown below:

	1971		1970	
	Number of Shares Under Option	Aggregate Option Price	Number of Shares Under Option	Aggregate Option Price
Outstanding, January 1	136,498	$3,632,000	178,416	$5,479,000
Granted	39,000	853,000	23,000	408,000
Exercised	(1,600)	(28,000)	—	—
Terminated	(40,750)	(1,220,000)	(64,918)	(2,255,000)
Outstanding, December 31	133,148	$3,237,000	136,498	$3,632,000
At December 31:				
Exercisable	51,548	$1,434,000	60,858	$1,774,000
Available for Grant	16,812		26,562	

The employee stock purchase plan entitles eligible employees to purchase unissued Common Stock or shares held in treasury at 85% of the closing market price of the Common Stock on certain quarterly dates. Through December 31, 1971 an aggregate of 902,304 shares for consideration of $4,735,000 had been issued, of which 112,784 shares for consideration of $2,048,000 were issued during 1971.

Federal and Foreign Taxes on Income Federal and Foreign Taxes on Income includes provisions applicable to continuing operations as follows:

	1971	1970
Current Income Taxes	$ 9,360,000	$ 4,114,000
Deferred Income Taxes	12,602,000	10,135,000
Investment Tax Credit	(946,000)	(644,000)
Total Provision for Taxes	$14,016,000	$13,605,000

Deferred Income Taxes arise due to differences between reported and taxable income relating to accelerated methods of depreciation, allowances for estimated losses on facility abandonments and certain deferred costs.

Discontinued Operations and Extraordinary Items A loss of $1,601,000 representing 1970 operations of discontinued businesses, including income tax effects, has been included in Accounts Payable and Other Liabilities and shown under the caption "Loss from Discontinued Operations". The remaining extraordinary loss on this sale or disposition amounted to $10,500,000 net of related tax benefits of $6,737,000 in 1970.

Earnings Per Share of Common Stock Earnings Per Share of Common Stock are based on the weighted average number of shares of Common Stock outstanding during the respective years. Dilution from outstanding stock options and warrants is not material or is offset by the anti-dilutive effect of the convertible preferred stock.

CX-174-Z-1

Fully Diluted Earnings Per Share recognizes the potential exercise or purchase of common stock equivalents, and the assumed conversion of the 3¾% Subordinated Debentures. For the purpose of this calculation, Net Income is adjusted to reflect elimination of interest and issue expense, net of income taxes, relating to the assumed conversion of the debentures.

Retirement Plans Airco and its subsidiaries maintain retirement plans covering substantially all officers and employees. It is Airco's policy generally to fund the pension cost accrued. The value of vested benefits based on actuarial determinations is fully funded. The total pension expense for the years ended December 31, 1971 and 1970 was approximately $2,997,000 and $2,864,000, respectively.

Commitments The unexpended portion of amounts authorized for capital expenditures at December 31, 1971 approximated $20,287,000, as to which commitments have been made for approximately $7,439,000.

Annual rental payments for long-term leases, extending for various periods of from three to thirteen years, approximated $13,100,000 at December 31, 1971. Of this amount, $1,600,000 pertains to warehouse and office rentals and $11,500,000 pertains to plant and equipment.

Future payments representing the principal amount for existing long-term leases for plant and equipment approximated $71,000,000 at December 31, 1971. Approximately 70% of these future payments pertain to tonnage gas plants, which supply customers under long-term sales contracts providing for aggregate minimum revenues which more than cover the aggregate rentals under such leases.

Accountants' Opinion

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TWO BROADWAY
NEW YORK 10004

To the Stockholders of Airco, Inc.:

We have examined the consolidated balance sheets of Airco, Inc. and subsidiaries as of December 31, 1970 and 1971 and the related statements of consolidated income, stockholders' equity, and changes in financial position for the years then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned statements present fairly the financial position of the companies at December 31, 1970 and 1971 and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Haskins & Sells

March 1, 1972

A 4622

Consolidated Balance Sheet

DECEMBER 31, 1971 AND 1970

CR-176-Z-2

ASSETS	1971	1970
CURRENT ASSETS		
Cash and Short-Term Securities, at cost	$ 20,630,000	$ 14,691,000
Notes and Accounts Receivable (less allowances for doubtful accounts—1971, $703,000; 1970, $672,000)	84,433,000	85,546,000
Receivable from Disposition of Properties	2,000,000	9,286,000
Inventories	123,554,000	106,295,000
Prepaid Expenses	3,933,000	3,360,000
Total Current Assets	234,550,000	218,480,000
PROPERTY, PLANT AND EQUIPMENT (at cost)		
Land	8,224,000	7,885,000
Buildings and Leasehold Improvements	108,631,000	105,161,000
Machinery and Equipment	398,126,000	372,760,000
Construction in Progress	18,339,000	21,178,000
Domestic Pipeline Production and Distribution	5,250,000	5,250,000
Total	538,620,000	512,234,000
Less—Accumulated Allowances for Depreciation, Amortization and Depletion	223,453,000	210,317,000
Property, Plant and Equipment—Net	315,167,000	301,917,000
INVESTMENTS (at cost, which approximates equity in underlying assets)	3,928,000	5,307,000
LONG-TERM RECEIVABLES	16,439,000	16,000,000
DEFERRED CHARGES	7,385,000	7,872,000
GOODWILL, PATENTS AND TRADEMARKS (net of amortization)	5,317,000	5,009,000
TOTAL	$583,306,000	$554,593,000

The accompanying Notes to Consolidated Financial Statements and Arthur Andersen & Co.'s report are an integral part of this statement.

CX-176-Z-3

LIABILITIES AND STOCKHOLDERS' EQUITY	1971	1970
CURRENT LIABILITIES		
Accounts Payable	$ 32,038,000	$ 27,840,000
Currently Maturing Long-Term Debt	2,730,000	5,610,000
Accruals	17,870,000	19,052,000
Federal and Foreign Taxes on Income	871,000	2,847,000
Total Current Liabilities	53,559,000	55,349,000
LONG-TERM DEBT		
Convertible Subordinated Debentures, 3⅞%, due 1977-87	31,762,000	31,762,000
Sinking Fund Debentures, 6½%, due 1987	2,469,000	2,566,000
Domestic Bank Notes, 5½% Currently, due 1973-77	64,604,000	64,671,000
Foreign Bank Notes, 7%-7¾% Currently, due 1973-77	15,274,000	15,391,000
Promissory Notes, 4¼%-8% Currently, due 1973-88	68,159,000	69,644,000
Other Debt (principally mortgages)	5,456,000	5,463,000
Total Long-Term Debt	187,724,000	190,497,000
DEFERRED INCOME TAXES	73,788,000	62,990,000
STOCKHOLDERS' EQUITY	268,235,000	255,747,000
TOTAL	$583,306,000	$564,583,000

Statement of Consolidated Income

FOR THE YEARS ENDED DECEMBER 31, 1971 AND 1970

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CX-176-Z-4

	1971	1970
Net Sales	$440,562,000	$436,301,000
Other Income—Net	3,468,000	4,969,000
Total	444,030,000	441,270,000
Deductions		
Cost of Goods Sold	339,677,000	335,109,000
Selling, Administrative and Other Expenses	60,565,000	61,900,000
Interest Expense	10,709,000	11,558,000
Federal and Foreign Taxes on Income	14,016,000	13,605,000
Total	424,967,000	423,176,000
Income From Continuing Operations	19,063,000	18,295,000
Loss From Discontinued Operations, Net of Income Taxes	—	(1,301,000)
Income Before Extraordinary Items	19,063,000	16,994,000
Extraordinary Items, Net of Income Taxes	—	(1,301,000)
Net Income	$ 19,063,000	$ 15,693,000
Earnings Per Share of Common Stock		
Income From Continuing Operations	$1.64	$1.60
Loss From Discontinued Operations	—	(.11)
Income Before Extraordinary Items	1.64	1.49
Extraordinary Items, Net of Income Taxes	—	(.92)
Net Income	$1.64	$ .57
Fully Diluted Earnings Per Share		
Income From Continuing Operations	$1.55	$1.51
Loss From Discontinued Operations	—	(.10)
Income Before Extraordinary Items	1.55	1.41
Extraordinary Items, Net of Income Taxes	—	(.84)
Net Income	$1.55	$ .57

The [illegible] Statement of Accounting Policies and Financial Review are an integral part of this statement.

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Statement of Stockholders' Equity

FOR THE YEARS ENDED DECEMBER 31, 1971 AND 1970

AIRCO, INC. AND SUBSIDIARIES

CX-175-2-5

	Common Stock —$1 par value	Capital in Excess of Par Value	Retained Earnings	Treasury Stock —at cost	Total Stockholders' Equity
Balance at January 1, 1970	$11,366,000	$106,053,000	$139,414,000	$(611,000)	$256,222,000
Net Income			6,494,000		6,494,000
Stock Issued Under Employee Stock Purchase Plan (155,258 shares)	155,000	2,039,000			2,194,000
Dividends on Common Stock ($.80 per share)			(9,163,000)		(9,163,000)
Balance at December 31, 1970	11,521,000	108,092,000	136,745,000	(611,000)	255,747,000
Adjustment for Pooled Company (49,438 shares)	49,000	1,000	585,000		635,000
Balance at January 1, 1971, as Restated	11,570,000	108,093,000	137,330,000	(611,000)	256,382,000
Net Income			19,060,000		19,060,000
Stock Issued Under Employee Stock Purchase Plan (113,784 shares)	114,000	1,934,000			2,048,000
Stock Option Plans (11,600 shares)	2,000	26,000			28,000
Dividends on Common Stock ($.80 per share)			(9,286,000)		(9,286,000)
Balance at December 31, 1971	$11,686,000	$110,053,000	$147,107,000	$(611,000)	$268,235,000

The notes on pages [illegible] headings "Statement of Accounting Policies" and "Financial Review" are an integral part of this statement.

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CX-17-Z-6

Statement of Changes in Financial Position

FOR THE YEARS ENDED
DECEMBER 31, 1971 AND 1970

	1971	1970
Sources of Working Capital		
From Operations		
Income Before Extraordinary Items	$ 19,063,000	$ 16,994,000
Charges not Requiring Current Outlays of Working Capital		
Depreciation and Amortization	26,616,000	27,867,000
Deferred Income Taxes	10,798,000	9,989,000
Working Capital Provided from Operations, Exclusive of Extraordinary Items	56,477,000	54,850,000
Extraordinary Items, Net of Income Taxes	—	(10,500,000)
Charges (Credits) Not Involving Working Capital		
Reduction in Non-Current Assets from Disposition of Certain Businesses and Properties Net of Non-Current Receivables of $11,587,000	—	19,724,000
Deferred Income Taxes	—	(6,694,000)
Working Capital Provided from Extraordinary Items	—	2,530,000
Total from Operations	56,477,000	57,380,000
Proceeds from Long-Term Debt	7,645,000	66,774,000
Sales of Stock to Officers and Employees	2,076,000	2,194,000
All Other Sources—Net	3,566,000	(1,271,000)
Total Sources of Working Capital	69,764,000	124,977,000
Uses of Working Capital		
Capital Expenditures for Property, Plant and Equipment	32,200,000	49,900,000
Dividends on Common Stock	9,286,000	9,163,000
Reduction in Long-Term Debt	10,418,000	55,605,000
Total Uses of Working Capital	51,904,000	114,668,000
Increase in Working Capital During Year	17,860,000	10,309,000
Working Capital at Beginning of Year	163,131,000	152,822,000
Working Capital at End of Year	$180,991,000	$163,131,000
Changes in Elements of Working Capital		
Increase (Decrease) in Current Assets		
Cash and Short-Term Securities	$ 5,939,000	$ (2,763,000)
Notes and Accounts Receivable	(1,413,000)	411,000
Receivable from Disposition of Properties	(7,233,000)	9,233,000
Inventories	18,259,000	3,933,000
Prepaid Expenses	573,000	(201,000)
Change in Current Assets	16,070,000	10,613,000
Increase (Decrease) in Current Liabilities		
Accounts Payable	4,248,000	(1,310,000)
Currently Maturing Long-Term Debt	(2,880,000)	3,067,000
Accruals	(1,182,000)	3,671,000
Federal and Foreign Taxes on Income	(1,976,000)	(244,000)
Change in Current Liabilities	(1,790,000)	384,000
Increase in Working Capital During Year	$ 17,860,000	$ 10,309,000

The accompanying "Statement of Accounting Policies" and "Financial Review" are integral parts of this statement.

A 4627

Five-Year Financial Summary

FIGURES IN THOUSANDS EXCEPT PER SHARE DATA

AIRCO, INC. AND SUBSIDIARIES

CX-176-Z-7

	1971**	1970	1969**	1968**	1967
Sales and Earnings					
Net sales*	$440,562	436,501	433,665	383,197	363,042
Income before taxes*	$ 33,079	31,900	31,911	32,139	43,998
Income from continuing operations	$ 19,063	18,295	20,148	20,423	26,205
Income (loss) from discontinued operations	$ —	(1,301)	178	(960)	(1,490)
Income before extraordinary items	$ 19,063	16,994	20,326	19,463	24,715
Extraordinary items	$ —	(10,500)	—	1,515	(12,000)
Net income	$ 19,063	6,494	20,326	20,978	12,715
Average number of common shares outstanding	11,645	11,432	11,303	11,109	10,855
Earnings per share of common stock from continuing operations*	$ 1.64	1.60	1.78	1.84	2.41
Dividends Paid					
Dividends per common share	$ .30	.90	1.15	1.60	1.60
Dividends on common stock	$ 9,206	9,140	12,861	16,647	16,101
Dividends by acquired companies	$ —	—	—	—	142
Financial Position					
Total assets (less applicable reserves)	$583,306	564,533	550,210	498,624	467,199
Working capital	$180,991	168,131	162,822	138,143	134,003
Gross property account	$538,620	522,232	545,022	523,181	492,567
Depreciation and amortization*	$ 26,616	25,360	23,848	22,628	17,824
Long-term debt	$187,724	190,497	179,329	150,339	140,536
Stockholders' Equity					
Amount	$268,235	255,747	256,222	244,573	242,663
Common stock outstanding—shares	11,668	11,504	11,048	11,036	11,092
Per share	$ 22.99	22.23	23.19	22.16	21.88

* Continuing operations. Earnings per share of common stock are before discontinued operations and extraordinary items.

** Income and operating results of companies acquired in pooling of interests in 1971, 1969 and 1968 include such items for periods prior to acquisition. Other years have not been restated as pooling of interests. Inclusion of these companies for full periods for sales and net income would not have a substantial effect on sales and net income.

Directors

A 4628

*GEORGE S. DILLON
Chairman of the Board and
Chief Executive Officer

*RICHARD V. GIORDANO
President and Chief Operating Officer

*JOHN A. HILL
Chairman of the Executive Committee

*CHARLES S. MUNSON
Honorary Chairman of the Board

RICHARD G. FOLSOM
Retired President,
Rensselaer Polytechnic Institute

*CLARENCE FRANCIS
Industrialist, Retired Chairman of
the Board, General Foods Corporation

JOSEPH H. HUMBERSTONE
Group Vice President

[illegible]
Partner, Brown [illegible] Harriman & Co.

[illegible]

ROBERT E. MCNAIR
Partner, McNair, Hamburg & Conley,
Attorneys, Columbia, S.C.

*[illegible]
Chairman of the Board
Marine Midland Bank—New York

[illegible]
President and Chief Executive Officer,
Southern Natural Gas Company

[illegible]
President, Arco Tennessee Division

[illegible]
Partner, Shearman & Sterling

*Executive Committee

Officers

CX-175-2-3

GEORGE S. DILLON
Chairman of the Board and
Chief Executive Officer

RICHARD V. GIORDANO
President and Chief Operating Officer

JOSEPH H. HUMBERSTONE
Group Vice President

NORRIS B. McFARLANE
Group Vice President

DAVID J. CRAIG
Group Vice President

DAVID H. LYALL
Vice President

DONALD REICH
Vice President—Finance and Law

HENRY M. KOSTER
Assistant Vice President

DONALD B. BUSSEMAKER
Controller

[illegible]
Treasurer

JOSEPH [illegible], JR.
Secretary

Divisions and Subsidiaries

A 4629

CA-176-2-9

AIRCO ALLOYS AND CARBIDE DIVISION
[illegible] Avenue, Niagara Falls, N.Y. 14305
Telephone: [illegible]
[illegible] Dann, *President*

Airco Alloys AB
[illegible] Hisingen, Sweden
[illegible] *Managing Director*

Airco Alloys and Carbide Ltd.
[illegible] Street, London, S.W. 1, England
[illegible] Mercer, *Senior V.P.—International*

Airco Alloys G.m.b.H.
[illegible] Strasse 4, Cologne-Deutz 5, West Germany
[illegible] *Managing Director*

AIRCO CRYOGENICS DIVISION
[illegible] Street, Irvine, Calif. 92664
Telephone: (714) 540-0310
Paul R. Duran, *President*

Cryostar AG
4133 Pratteln, Basel, Switzerland
Helmut Bauer, *Managing Director*

AIRCO INDUSTRIAL GASES DIVISION
575 Mountain Avenue, Murray Hill, N.J. 07974
Telephone: (201) 464-8100
Charles H. Simpson, *President*

Airco Cryoplants Corporation
[illegible] Avenue, Murray Hill, N.J. 07974
[illegible]

N.V. Airco Carbonzuur [illegible]
[illegible]

AIRCO SPEER [illegible]
[illegible]
Telephone: (814) [illegible]
[illegible]

Speer Carbon Co. of Canada Ltd.
3300 Dalton Street, St. Laurent, Montreal 390, Quebec
Grant M. Greenfield, *Vice President & General Manager*

AIRCO SPEER ELECTRONICS DIVISION
900 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2201
Lawrence M. Liggett, *President*

Airco de Mexico S.A. de C.V.
Calle Hermosillo 451, Nogales, Sonora, Mexico
Robert E. Brubaker, *General Manager*

Airco Singapore Pte., Ltd.
[illegible] International Road, Jurong Industrial Estate, Singapore, 22
Charles L. Foster, *General Manager*

AIRCO TEMESCAL DIVISION
2850 Seventh Street, Berkeley, Calif. 94710
Telephone: (415) 841-6700
Ryan D. Smith, Jr., *President*

Airco Temescal N.V.
Building 10, P.O. Box 7709, Schiphol-Oost, Netherlands
Joseph De Bie, *Managing Director*

AIRCO VACUUM METALS DIVISION
705 Parker Avenue, Berkeley, Calif. 94710
Telephone: (415) 845-1140
John P. Strand, *President*

AIRCO VIKING DIVISION
[illegible] Circle, P.O. Box 328, Verona, [illegible]
Telephone: (201) 240-0345
[illegible] Weisberg, *President*

AIRCO WELDING PRODUCTS DIVISION
P.O. Box 281, Charleston, West Virginia 25322
Telephone: (304) [illegible]
Lawrence W. Kuhnle, *President*

OHIO MEDICAL PRODUCTS DIVISION
[illegible] Drive, P.O. Box 1015, Madison, Ohio 44057
Telephone: (800) 321-1551
[illegible] Boulder, *President*

Air Reduction Canada Ltd.
(Ohio Medical Products Canada)
[illegible] Street, [illegible]
[illegible] Porter, *Marketing Manager*

The following trademarks of Airco, Inc., appear in this Report: Airco, B.O.C., Airco Cryoplants, Arcaloy, Cryostar, Dri-Pak, Epic, Epoxtite, Espirant, Hanger, [illegible], Temescal, Viking, WARP, Weldmatic, [illegible], Zeal, Zeus, Speer, Temescal, Viking.

Printed in U.S.A.

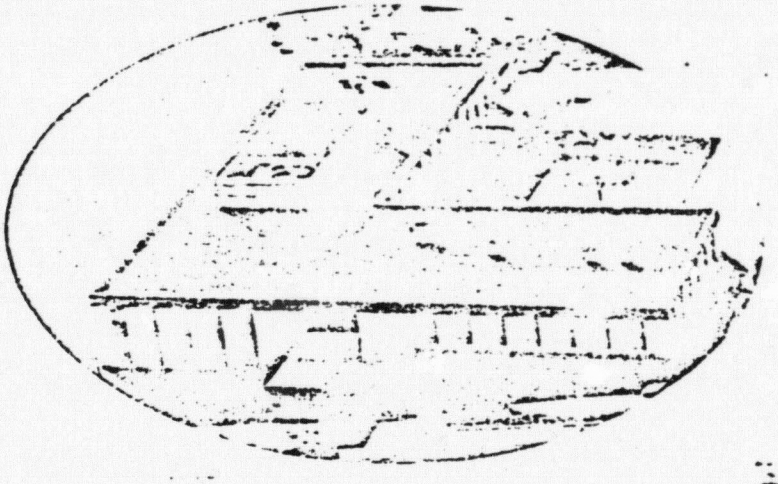
A 4630

CE-176-Z-10

Annual Report for Nineteen Seventy-two

A 4631

CX-177-A



[illegible] for Airco's Annual Meeting April 25, 1973

A 4632

CX-177-B

Airco shareholders are cordially invited to [illegible] 1973 Annual Meeting at 10 A.M. on Wednesday, April 25, 1973. The Meeting will be held in the Stanley Warner Theatre, East 250 Route Four, Paramus, New Jersey. Formal notice of the Annual Meeting, Proxy and Proxy Statement are included with this Report.

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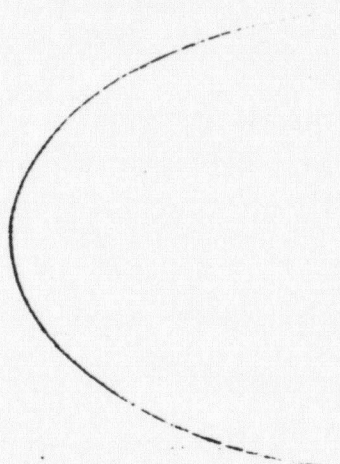
52 Directors / Corporate Officers



Corporate Data

GENERAL COUNSEL
Shearman & Sterling
53 Wall Street
New York, N.Y. 10005

AUDITORS
Haskins & Sells
2 Broadway
New York, N.Y. 10004

TRANSFER AGENT
First National City Bank
111 Wall Street
New York, N.Y. 10005

REGISTRAR OF STOCK
Morgan Guaranty Trust
Company of New York
23 Wall Street
New York, N.Y. 10005

STOCK LISTING
New York Stock Exchange

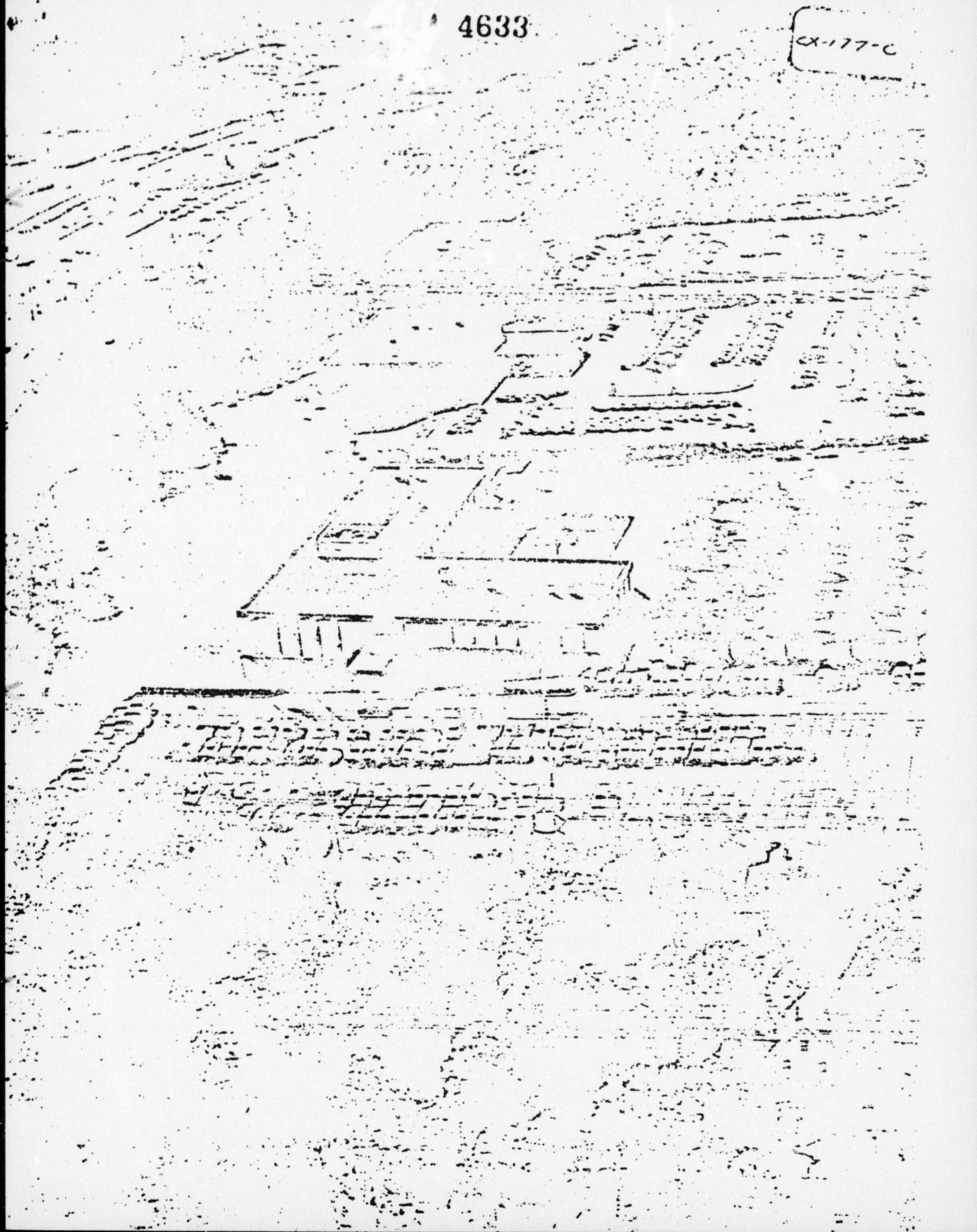
TICKER SYMBOL: AN

April issue of Airco's new [illegible] Montvale, New Jersey. On [illegible] 18, 1973, [illegible] annual meeting [illegible] Paramus, New Jersey [illegible] by shareholders [illegible] 25, 1973 [illegible] A.M. [illegible] 07645, [illegible] and reports [illegible]

Airco, Inc.

Executive Offices: 85 Chestnut Ridge Road, Montvale, New Jersey 07645 / Telephone: (201) 573-0800

CX-177-C



A 4634 CX-177-D

HIGHLIGHTS	1972	1971	Percent Change
Sales (1)	$492,295,000	$411,409,000	+ 19.7%
Depreciation and Amortization (1)	21,700,000	23,260,000	+ 6.7%
Income Before Taxes (1)	37,400,000	31,651,000	− 14.1%
Income From Continuing Operations (2)	17,941,000	18,243,000	− 1.7%
Income Per Share From Continuing Operations (2)	1.53	1.57	− 2.5%
Dividends Paid Per Share	.00	.60	—
Working Capital	173,762,000	183,787,000	− 5.5%
Working Capital Ratio	3.0	4.6	− 37.0%
Research and Development Expenditures (1)	6,755,000	8,281,000	− 18.4%
Facility Additions:			
Capital Expenditures	30,600,000	32,200,000	
Leased Facilities	3,900,000	1,600,000	
Total Facility Additions	44,500,000	33,800,000	+ 31.4%
Total Assets (less applicable reserves)	607,100,000	583,306,000	+ 4.1%
Stockholders' Equity	268,400,000	268,235,000	+ .2%
Book Value Per Share	22.81	22.99	− 0.8%
Shares of Common Stock Outstanding at End of Year	11,766,000	11,668,404	+ .8%
Number of Stockholders at End of Year	42,100	45,457	− 7.2%
Number of Employees at End of Year	13,035	12,251	+ 6.8%

(1) Continuing Operations

(2) Computed before extraordinary charge to income in 1972 of $16,000,000 or $1.37 per share and before income from discontinued operations of $77,000 or $.01 per share in 1972 and $815,000 or $.07 per share in 1971 (see "Financial Review", page 44)

March 12, 1973

To Our Stockholders:

Although we increased our sales about 20 per cent over 1971, and although all but two of our major divisions (Alloys and Carbon-Graphite) showed improved results, overall our earnings were substantially below the objective we had set for the year.

Sales and earnings Sales of continuing operations for 1972 were $492.3 million, about $80.9 million over comparable sales in 1971 of $411.4 million.

Income from continuing operations in 1972 was $17.9 million, or $1.53 per share, compared with $18.2 million, or $1.57 per share, the previous year. Net income for 1972 of $2 million, or 17 cents per share, reflects an extraordinary charge of $16 million, or $1.37 per share, as well as income of $77,000, or one cent per share, from discontinued operations. 1971 earnings from discontinued operations were $815,000, or seven cents per share.

The principal factor that adversely influenced 1972 results was sharply reduced earnings in our ferroalloys business—for many years a very important and consistent contributor to our profits. The fundamental problem was a worldwide oversupply of ferrochrome which led to massive imports into the United States and severe price competition. As a result, earnings from our ferroalloys business were 40 cents per share below 1971 levels. Lower prices for premium electrodes also reduced 1972 earnings from our carbon-graphite business. Although this price erosion was not as severe as in ferroalloys, the effects were significant.

In early February 1973, there was a price increase for graphite which, coupled with cost reductions, served to restore margins to pre-1972 levels. Price increases also were announced on most major ferroalloy products in mid-February. While the increases were modest, it currently appears that a more stable price structure is being re-established in this key Airco business area.

Divisional achievements Outstanding performances were achieved by several Airco divisions, including Industrial Gases, Welding Products, Medical Products, Cryogenics, Viking and Electronics. Sales and earnings performances for all Airco divisions are summarized in the "Division Performance Reviews" (pages 6 to 35 in this Report). The 1971-72 contributions to sales and earnings of our major product groups are detailed on page 38.

Extraordinary charge of $16 million reflected in sales and earnings As reported in our January 24, 1973 preliminary sales and earnings announcement, Airco made an extraordinary charge to income of $16 million, net of related tax benefits, to provide for losses related to the discontinuation of its carbide-acetylene business.

EX-177-E

Even though we anticipated the declining acetylene market as well as a sharp drop in usage by a major customer, we had planned—as early as mid-1971—to convert the larger carbide furnaces, with some 188,000 kilowatts of production capacity, to the manufacture of ferroalloys. However, extraordinary increases in the cost of power and the substantial cost of installing and operating effective air pollution controls, forced us to abandon this solution. The carbide furnaces at Calvert City, Kentucky, have been shut down, but our Louisville carbide facilities will continue to be operated to fulfill present commitments. This cost has been provided for in the extraordinary write-off.

Major organization changes. We would like to pay special tribute to John A. Hill, who retired from the Board of Directors in September 1972. Mr. Hill served Airco ably for 33 years, 20 of them as its Chief Executive Officer.

Douglas M. More joined Airco in November 1972 as Vice President—Law. Prior to joining Airco, Mr. More, 46, had been Vice President and General Counsel for Hooker Chemical.

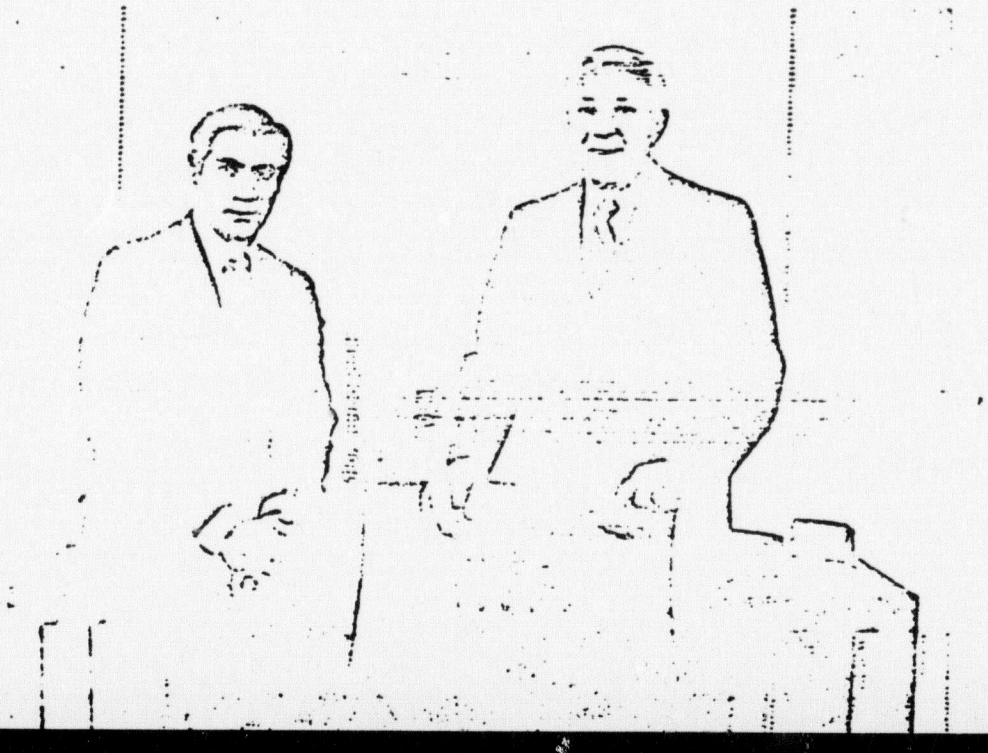
Long-term debt significantly reduced; more advantageous financing negotiated. At the end of 1972, Airco's long-term debt was $177.3 million, $10.4 million less than the $187.7 million debt existing as the year opened. During the year, we reduced the amount outstanding under a $75 million revolving credit agreement with a group of domestic banks from $64.5 million to $50 million. In August 1972, this revolving credit agreement was renegotiated in the reduced amount of $50 million and with more favorable interest rates and maturity dates. The amount outstanding under the agreement will fund on July 31, 1975, with repayment in semiannual installments commencing January 31, 1976, and ending in 1979. In the last quarter, we increased Eurodollar borrowings from $13 million to $18 million under existing credit agreements expiring at the end of 1976.

We also borrowed, on a short-term basis, $13 million from domestic banks for working capital purposes.

We want to express our appreciation to our stockholders, distributors and customers for their encouragement and support in 1972. We particularly wish to pay tribute to our more than 13,000 employees for their cooperation throughout the year.

RICHARD V. GIORDANO
President

GEORGE S. DILLON
Chairman



A 4636

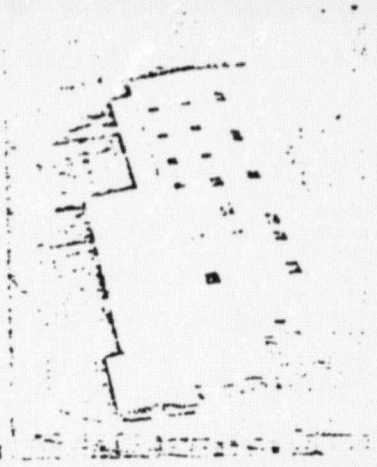
Building for future growth

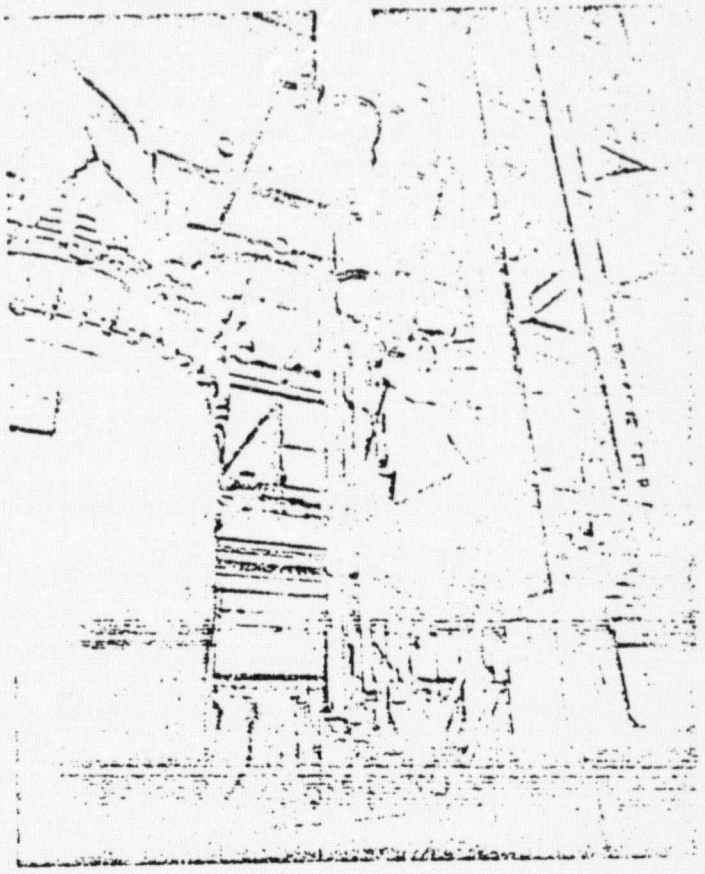
CX-477-F

Airco invested a total of $11.4 million during 1972 to add production capacity for new and existing product lines. This compares with $33.8 million in 1971. These amounts include capital expenditures, as well as facilities financed under long-term lease arrangements which totaled $3.9 million in 1972 versus $1.6 million in 1971.

The largest amounts were invested in new production facilities for ferroalloys and industrial gases. Other expenditures were for graphite, medical gas, forged metals, electronic and cryogenic facilities. In addition, Airco's corporate staff moved into its new headquarters building (illustrated on the first page) in Montvale, New Jersey.

Shown on these pages are the major projects completed or initiated during 1972: **1)** aerial view of expanded Viking plant, Verdi, Nevada; **2)** architect's sketch of cryogenic equipment facility under construction in Hesingue, France; **3)** oxygen plant being erected for Amoco Chemicals in Decatur, Alabama; **4)** interior view of recently completed facility in Cleveland, Ohio, for producing the new anesthetic agent, Ethrane; **5)** fish-eye view of the expanded cryogenic equipment plant in Irvine, California; **6)** production capacity was increased one-third at the electronic components facility in Singapore; **7)** foundation work began in mid-1972 for Airco's two new oxygen plants to serve the adjacent U.S. Steel facility in Fairfield, Alabama; **8)** new baghouse installed at the ferroalloys plant in Calvert City, Kentucky, controls air pollution from a large furnace; **9)** underground baking furnace is one of several being added to existing graphite manufacturing complex in Niagara Falls, New York; **10)** twilight view of new carbon dioxide plant brought on-stream in Lawrence, Kansas; **11)** student marching band helped Airco dedicate huge new ferroalloys furnace installation in Vargon, Sweden.





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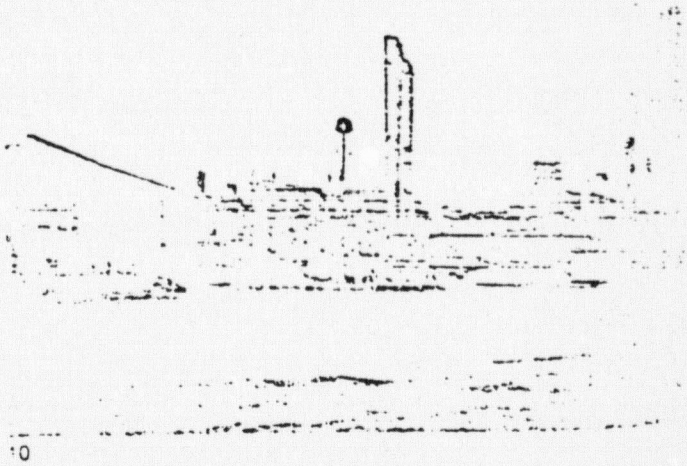

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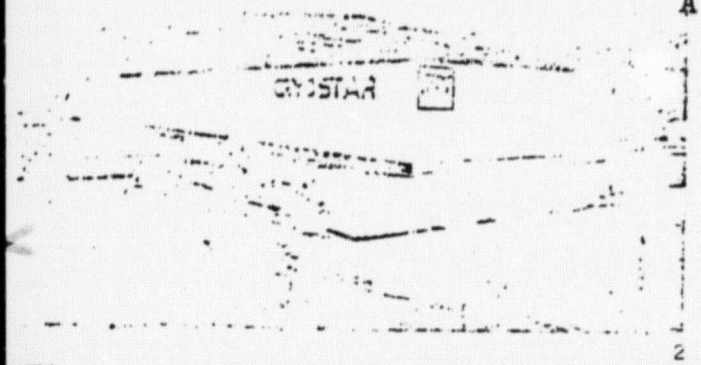

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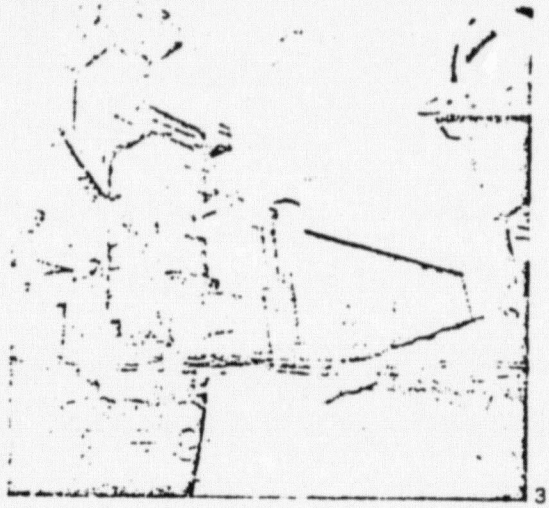

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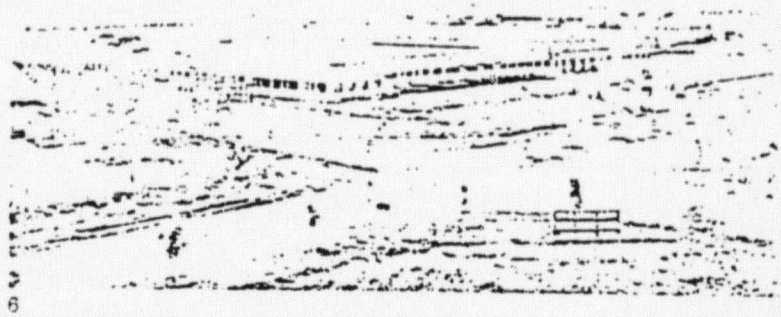

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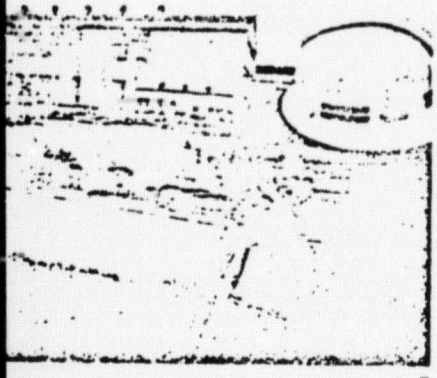

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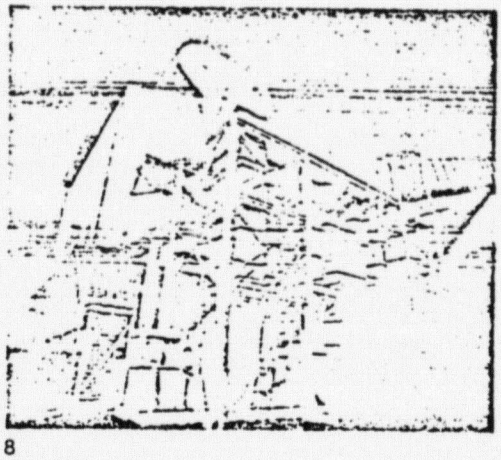

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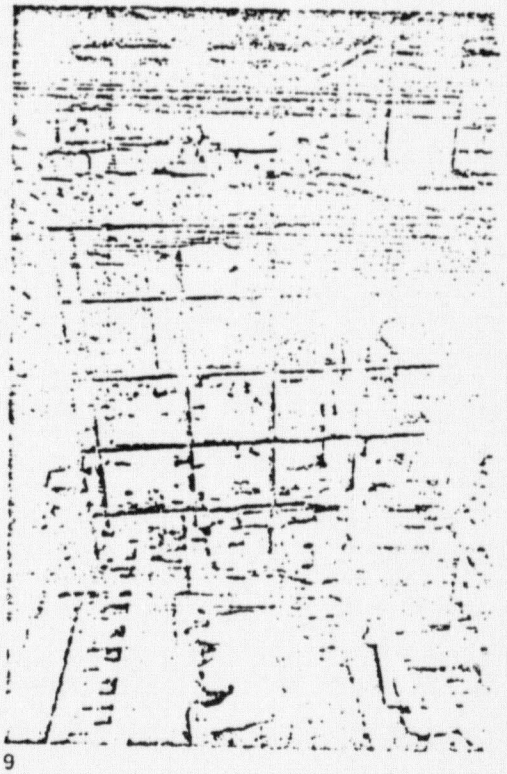

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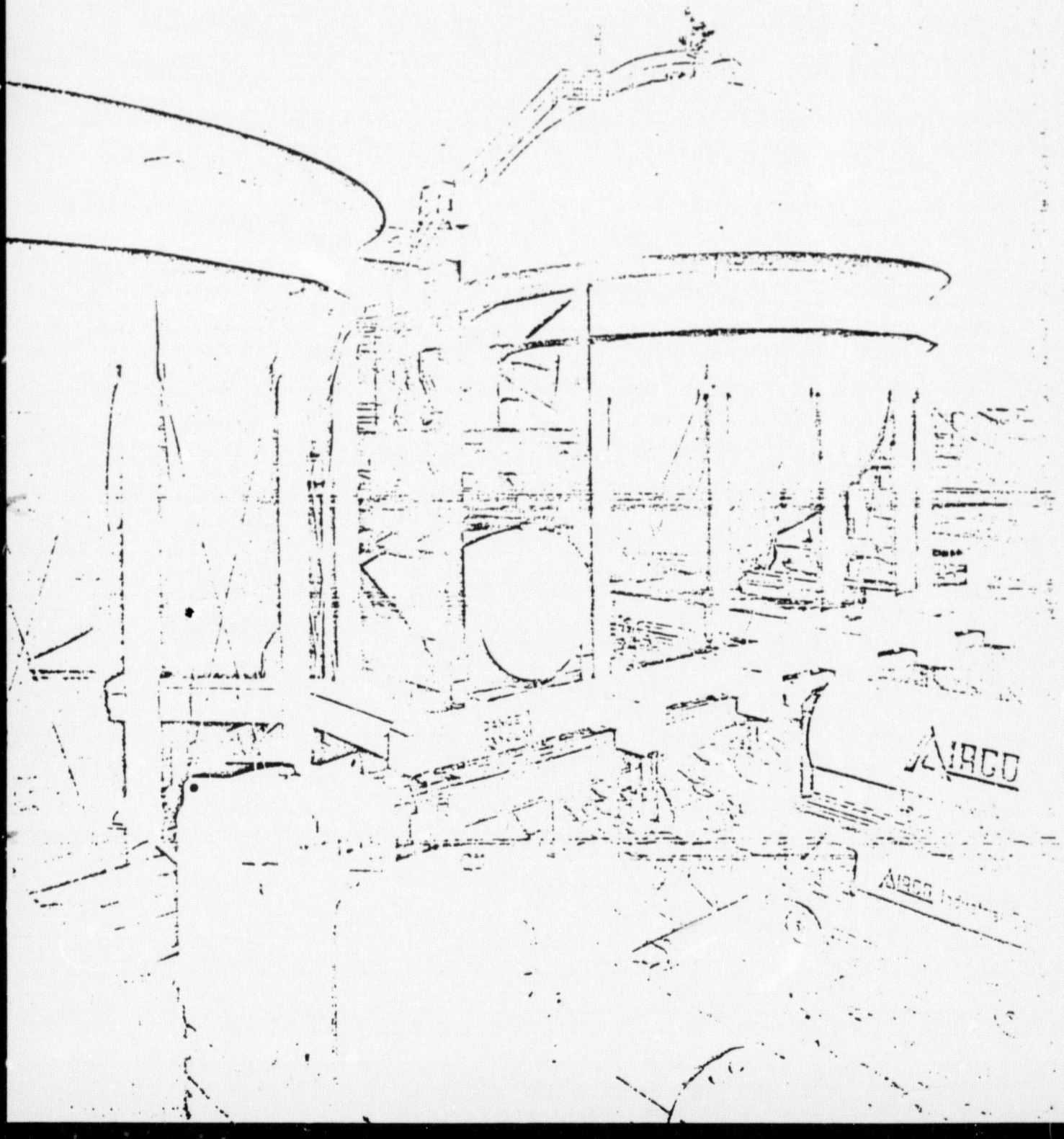


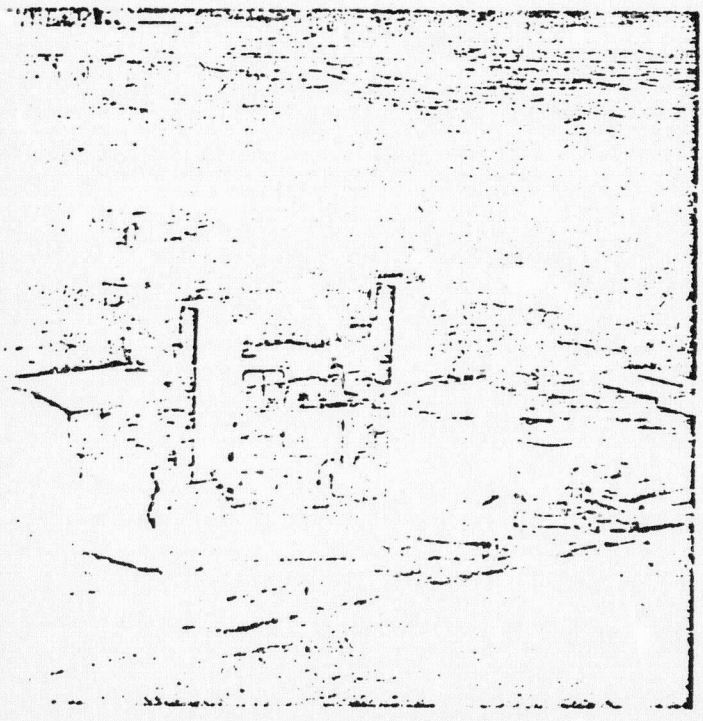
Demand for industrial gases and cryogenic plants boosted sales, profits and earnings to near-record levels for the year.

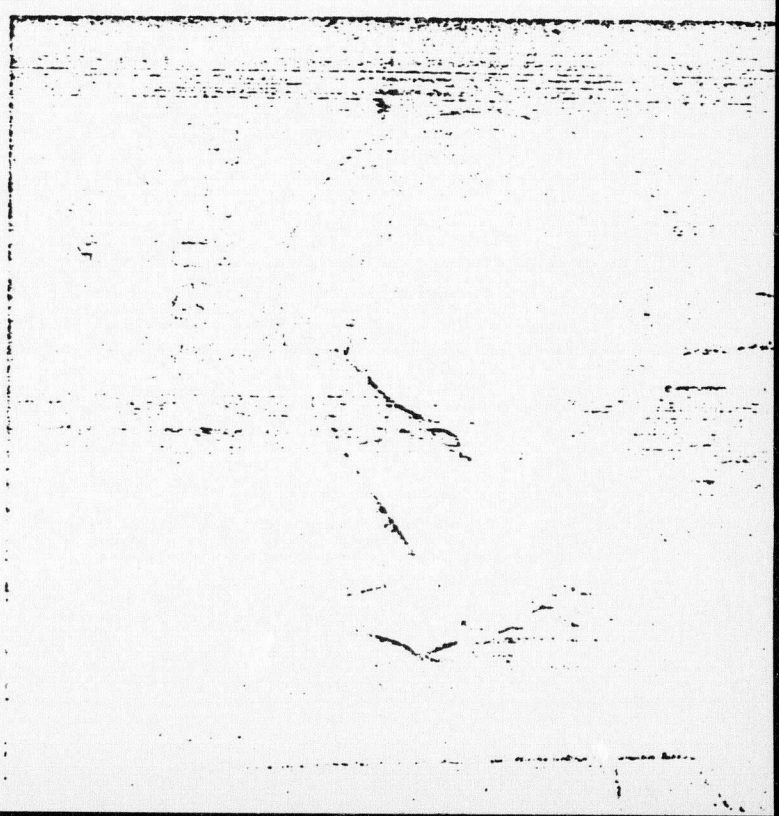
The Airco Industrial Gases Division registered a 44 per cent gain in overall sales and raised its income substantially, for the third consecutive year, to near all-time highs in 1972. These results included, for the first time, the full-year sales of the wholly owned Airco Cryoplants subsidiary. This excellent performance reflected stepped-up usage of industrial gases in key markets, a continued firming trend in bulk liquid merchant sales pricing, added efficiencies in plant and distribution operations and the completion and sale of several industrial gas and liquefied natural gas (LNG) plants.

Records set in pipeline and merchant sales

Record sales and earnings were achieved in pipeline and bulk liquid product areas. Near-capacity output of oxygen, nitrogen and carbon dioxide was maintained throughout the year to satisfy increased demand for oxygen in the steel and iron castings industries; for nitrogen in the electronics, glass and petroleum industries; and for new market uses, such as oxygen enrichment to increase efficiencies in cement production and argon to purge impurities in steelmaking.

Left: *Oxygen and nitrogen is piped to leading oil and chemical firms, such as DuPont, SunOil, Shell, PPG Industries, B.F. Goodrich and Monsanto, from Airco's 785-ton-a-day plant at Claymont, Delaware.* **Below:** *Airco's largest cryogenic facility—the 1,700-ton-a-day oxygen plant in Chester, West Virginia—serves a Jones & Laughlin Steel Corp. plant some 28 miles away in Aliquippa, Pennsylvania, via pipeline.* **Below Right:** *Oxygen injected into a cupola at U.S. Pipe & Foundry Co. in Burlington, New Jersey, increases production while reducing foundry costs.*





A 4640

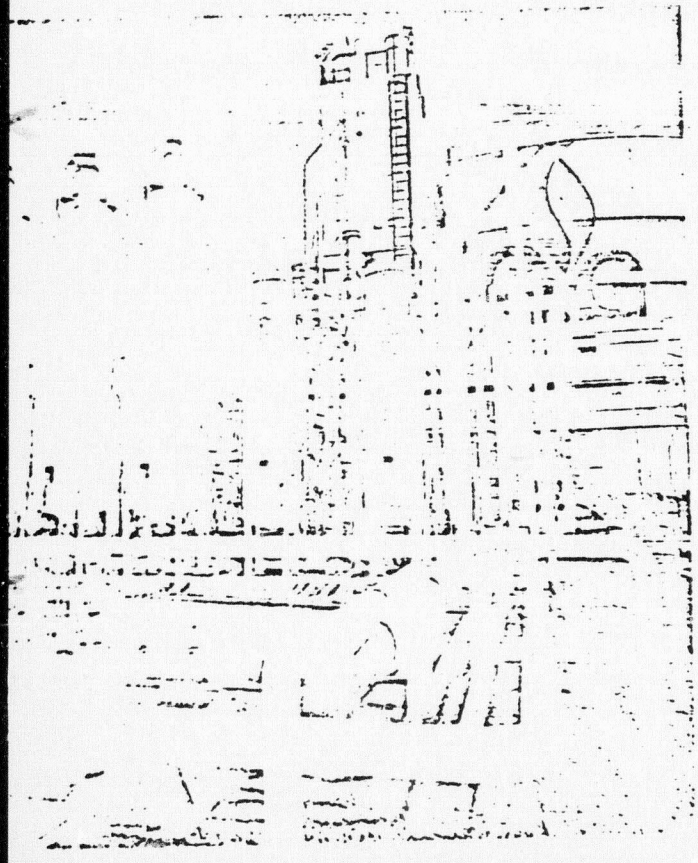
Carbon dioxide growth outpaced other gases

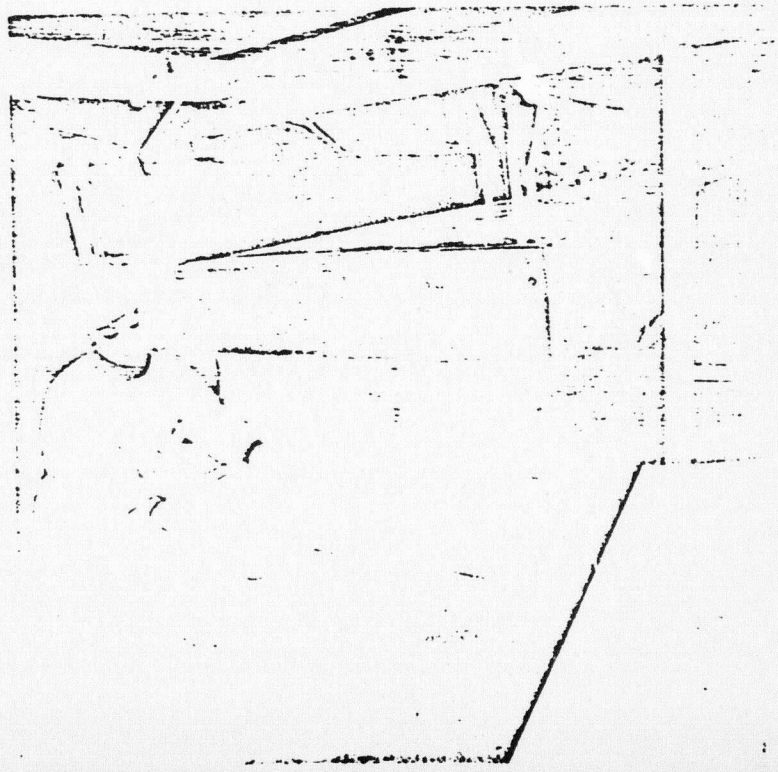
Sales of carbon dioxide, an outstanding growth segment of Airco's industrial gas business, continued to improve impressively. The advance was led by increased acceptance of Airco-developed food freezing and preservation processes in meat, poultry, bakery and convenience food markets. Particular strength was shown by the pelletized solid carbon dioxide refrigeration process used in frozen food shipments and in airline meal preparation.

Five cryogenic facilities placed on-stream

Contributing strongly to expanded sales was Airco Cryoplants Corporation which markets, designs and builds low-temperature air separation plants, carbon dioxide liquefaction plants, LNG plants and nitrogen generators. This subsidiary completed two 400-ton-a-day oxygen plants for a leading steel producer, and three LNG plants to help alleviate the mounting energy shortage. LNG facilities permit utility companies to store natural gas during slack periods in order to meet peak winter-month demands. Currently under construction are two major additions to Airco's Fairfield, Alabama oxygen plant to serve U.S. Steel, and two LNG plants.

Below: *An Airco-built liquefied natural gas plant near Hartford enables Connecticut Natural Gas Corp. to liquefy natural gas to 1/600 of its volume for storage.*
Below Center: *Airco's KwikFreeze liquid carbon dioxide tunnel processes chicken parts at Foster Farms in Livingston, California.*
Below Right: *Airco's mobile food laboratory travels coast to coast demonstrating the benefits of the company's various food freezing and refrigeration techniques.*
Top Right: *Nitrogen gas protects electronic parts from impurities during manufacture. An IBM Corporation technician transfers unfinished semiconductor wafers from one clean room to another at Essex Junction, Vermont.*





A 4641

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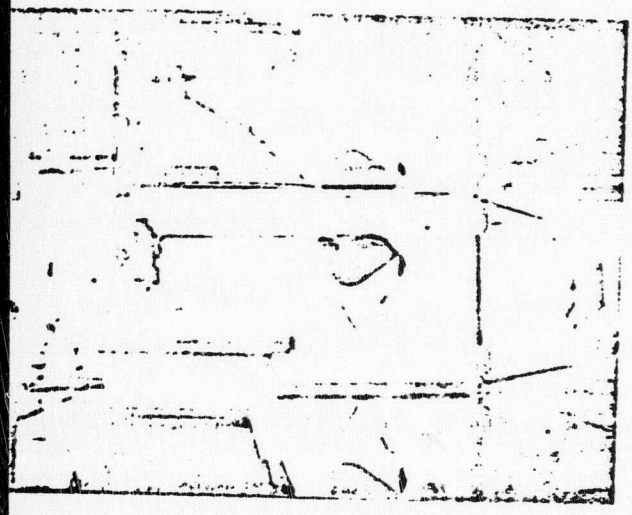
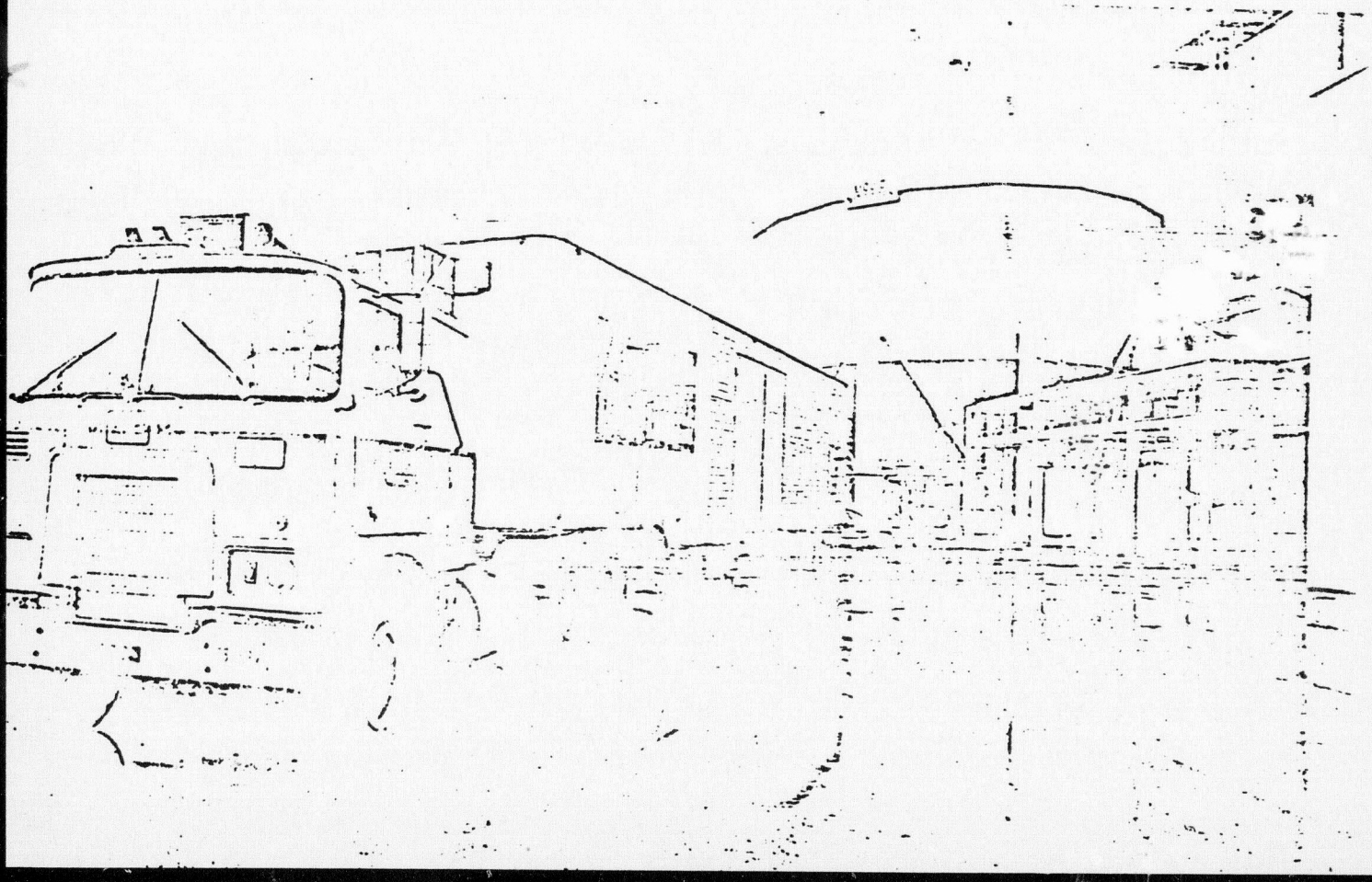
Products: Oxygen, nitrogen, argon, hydrogen, helium, carbon dioxide, rare gases (krypton, neon and xenon), cryogenic fluids and related equipment.

Plants: Fifteen on-site industrial gas and cryogenic fluid, two carbon dioxide, one liquid hydrogen, one rare gases, one gaseous hydrogen and four liquid helium conversion plants.

Markets: Iron and steel, nonferrous metals, cement, glass, chemical, food and beverage, electronics and electrical equipment, machinery, aerospace, metal fabricating, automotive, anti-pollution, Federal Government.





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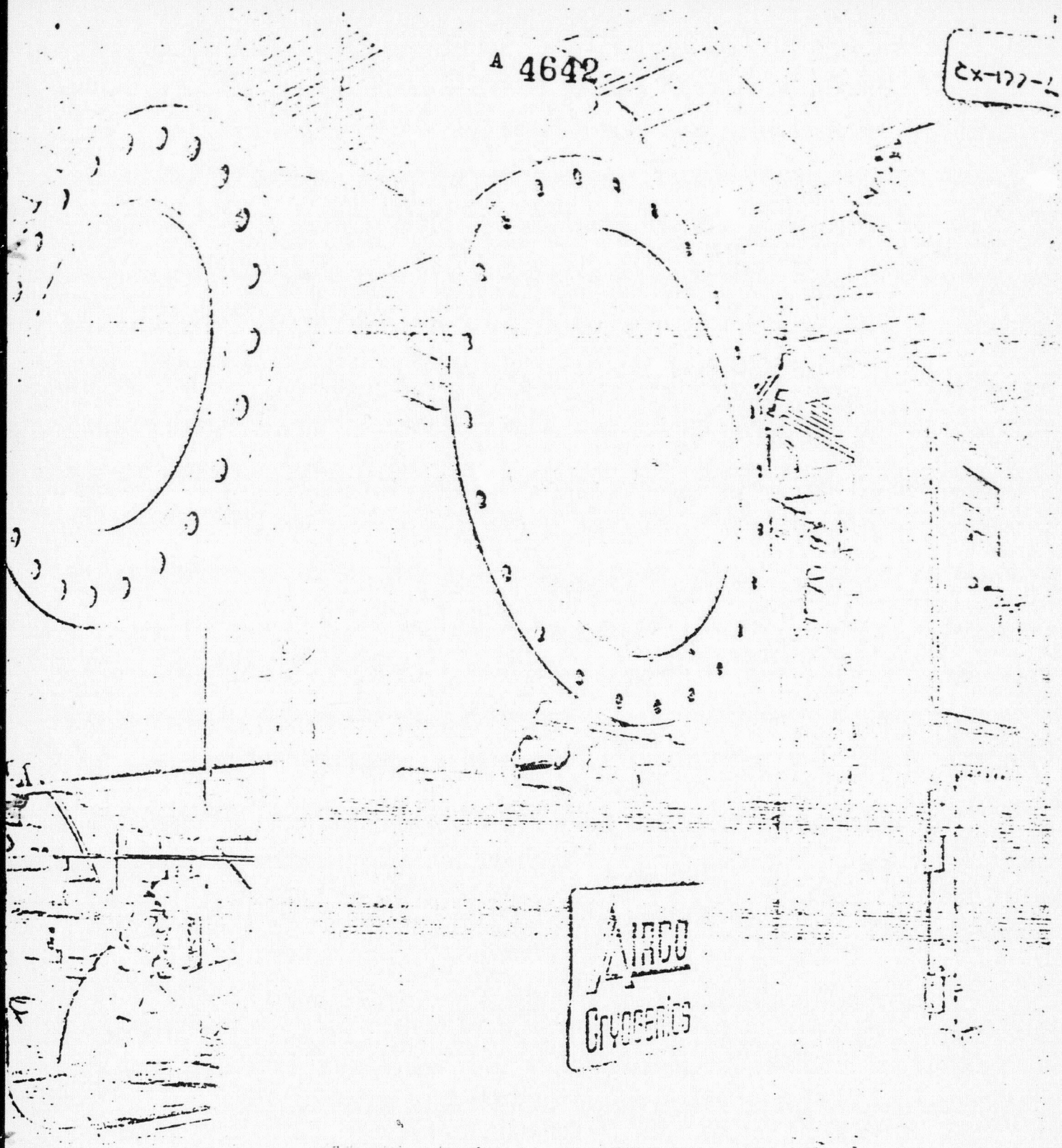


Sales of cryogenic equipment climbed 23%, and earnings advanced sharply as new products were widely accepted.

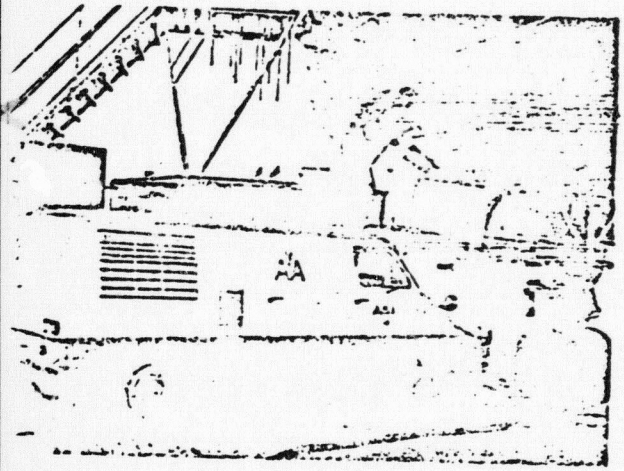
The Airco Cryogenics Division achieved sales and earnings records for the third consecutive year. Products developed and introduced during the past few years—freezing systems, high-pressure pumps, distribution equipment, turbocompressors and turboexpanders—gained particularly strong acceptance in the food processing, industrial gas, liquefied natural gas (LNG) and petrochemical markets.

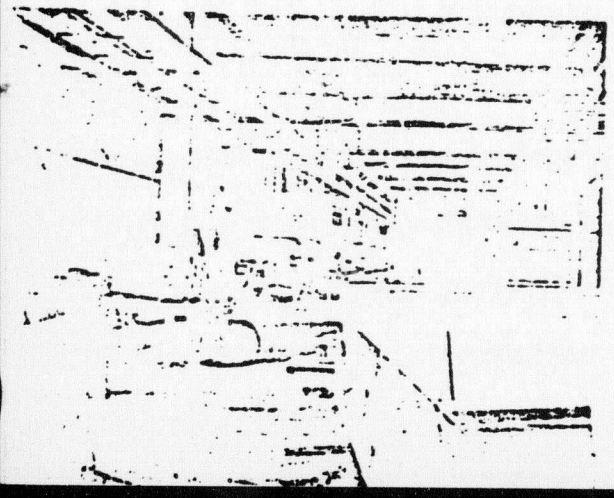
Domestic expansion completed; European plant being built

During the third quarter, the division completed a 55,000-square-foot addition to the Irvine, California plant, which doubled the division's domestic manufacturing capacity. Currently, an extensive LNG pump-testing facility is being engineered for construction at the same location later this year.

In mid-1972, the division started to erect its second European facility to manufacture cryogenic equipment. Located in Hesingue, France, the new plant is scheduled to be completed in the summer of 1973. Airco Cryogenics' original overseas manufacturing facility, located in Basel, Switzerland, continued to show sales and earnings improvements.

Left: *Huge turbo expander, for liquefying natural gas, shown under construction at the Irvine, California plant, was later installed at Texaco's Searobin project in Louisiana.* **Below:** *Jet aircraft starter/air conditioner services an American Airlines 747 jetliner prior to takeoff at Los Angeles International Airport.* **Bottom:** *Interior of new high-bay equipment assembly wing added to the Irvine plant in 1972.*





Products: Cryogenic and mechanical equipment; high-pressure, centrifugal and submerged-motor pumps, turbines, turbocompressors and turboexpanders; high-performance electric motors and alternators; closed-cycle refrigerators, food freezing equipment; vaporizers and heat exchangers; life support equipment, carbon dioxide pelletizers, aircraft ground support equipment.

Plants: Irvine, California; Basel, Switzerland (Cryostar AG), Hesingue, France (Cryostar France SA).

Markets: Industrial gas, food, liquefied natural gas, aerospace, electronics, research, petrochemical, shipbuilding and airlines.

A 4644

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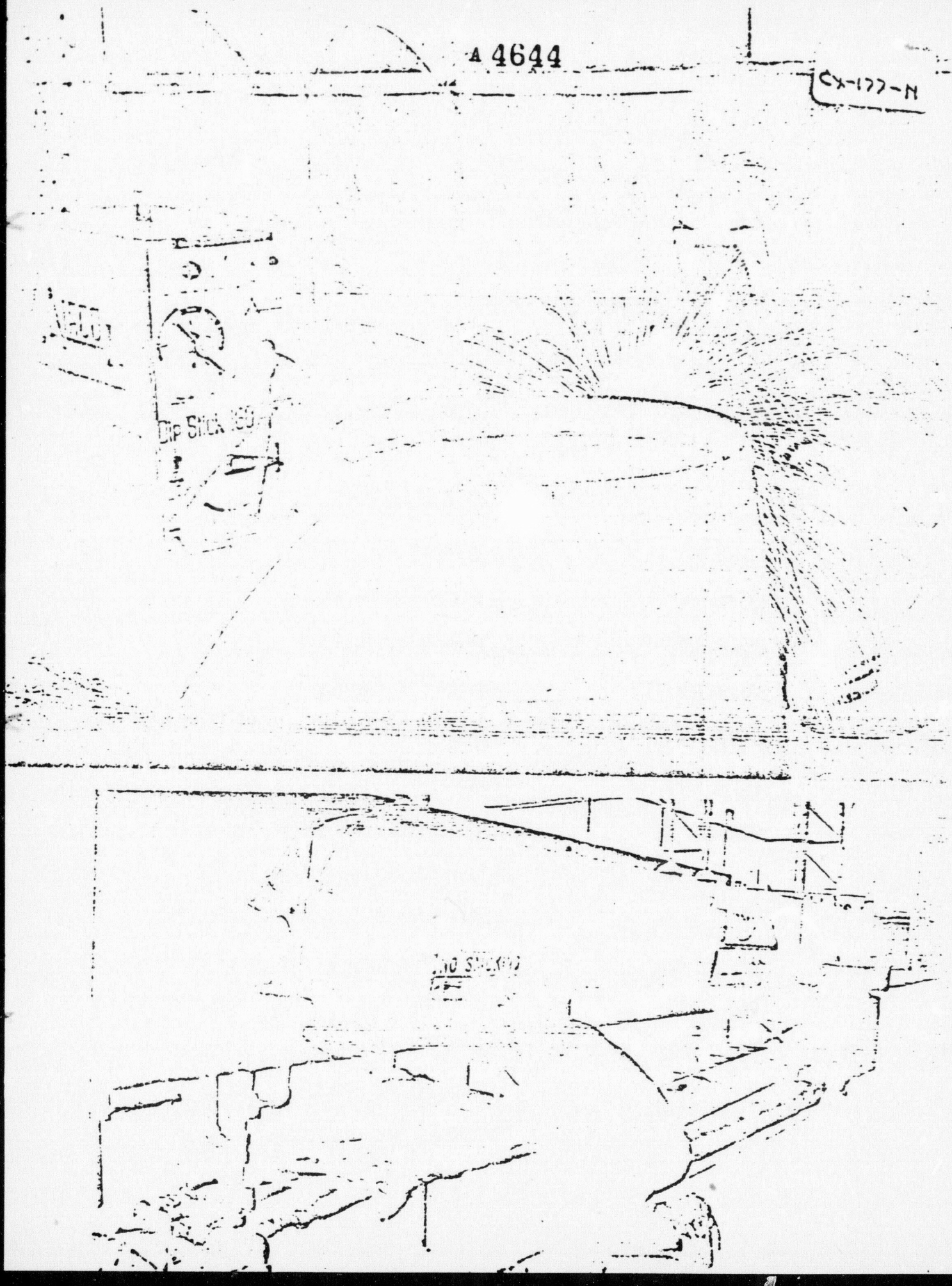


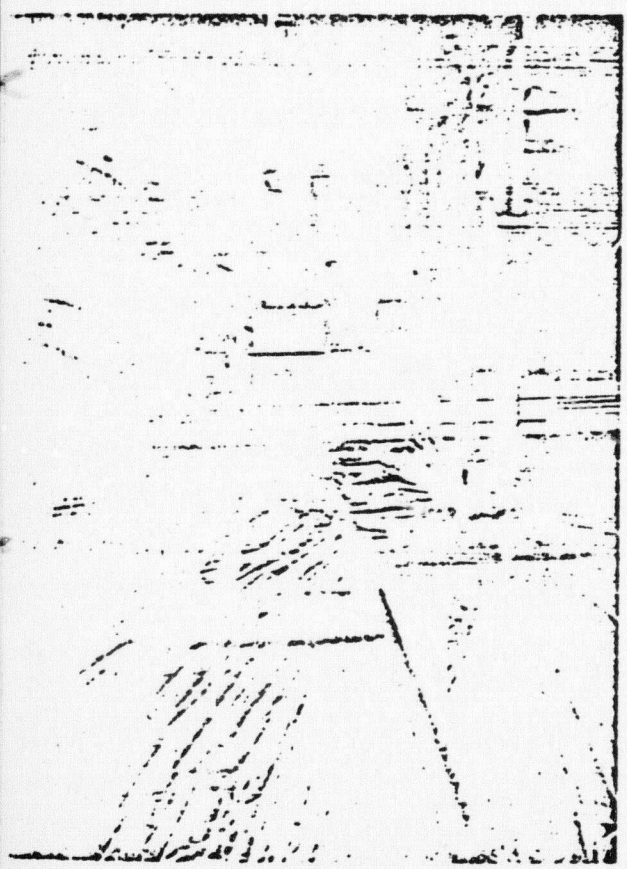
An 11% sales increase and substantial earnings rise set new records, reflecting high demand for welding equipment.

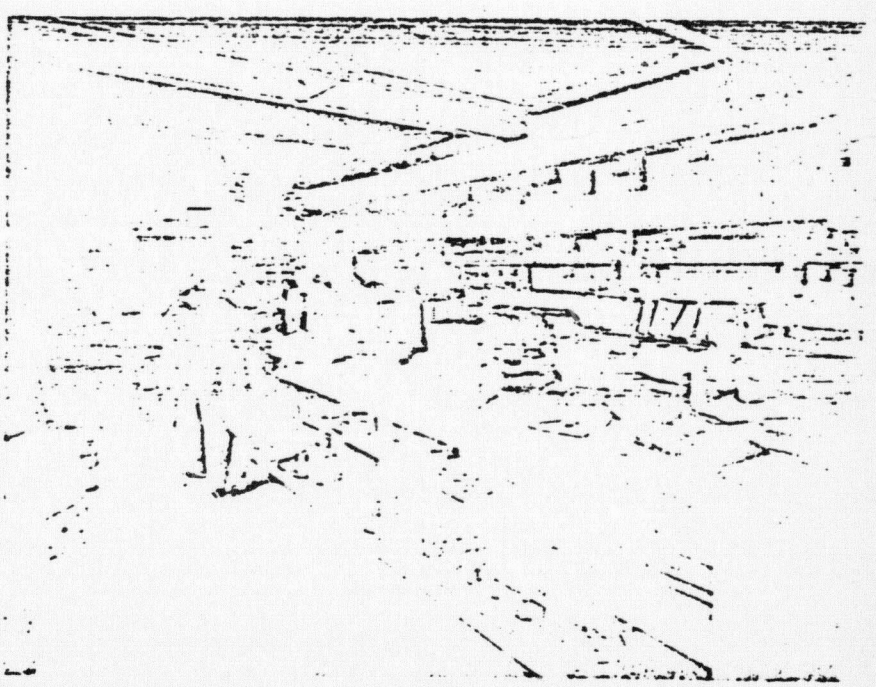
All-time record sales and earnings were attained by the Airco Welding Products Division in 1972. Spurred by a high demand for welding equipment in the capital goods industries, sales climbed 11 per cent over 1971. Combined higher sales volumes and effective cost controls resulted in a significant rise in earnings. Particular strength was shown in gas apparatus, power sources, welding equipment and filler metals. Airco's safety products and welding accessories producer, Jackson Products, continued to show solid gains for the third year in a row, recording all-time highs in both sales and earnings.

Key sales role played by distributors

Another major contributing factor in this division's outstanding performance was the efforts of the nationwide network of 300 authorized Airco distributors. More than 90 per cent of overall division sales are through distributors. Together, Airco and its distributors serve the everyday as well as the sophisticated welding needs of a vast cross section of U.S. industry.

Airco's nationwide distributor organization serves the welding needs of many industries. **Top Left:** *A grain aeration system is built by Marlatt Sheet Metal Co. with the new Dial/Stick 160 welding unit supplied by Welders Equipment Co., Inc. of Corpus Christi, Texas.* **Bottom Left:** *Workman checks MAPP gas tank installed by Hendrickson Equipment & Welding Supply Co., Inc. at Union Pacific's Omaha repair yards.* **Below:** *The new 5072 Duo-Grain from Welding Products of Georgia flame cuts railcar parts at Davidson-Kennedy Co. in Atlanta.* **Below Right:** *Welding products displayed at Berks Welding Supply Inc., Airco's authorized distributor in Reading, Pennsylvania.*





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Customers, both small and large, receive the personal attention, quick service and technical backup which are so important in attaining higher sales volumes.

Airco is broadening the impact of its distributor organization in the marketplace by developing a new generation of products, all technically designed and competitively priced to reach every segment of the growing welding market. As a result of these programs, the number of distributors surpassing $1 million in annual sales increased fourfold over 1971.

Two manufacturing firms acquired in 1972

Early in the year, Airco purchased Mid-States Welder Manufacturing Company, a Chicago-based producer of welding power sources and electrical equipment. Mid-States has been most effective in developing and producing electrical controls to complement Airco's welding products line. The division further widened its participation in the safety products area with the acquisition of Aden Supply Company of Belmont, Michigan, on November 10, 1972. Aden, which manufactures a large assortment of safety glasses and accessory items, sells its products through Jackson Products and, in turn, distributes other Jackson lines.

Products: Oxyacetylene, oxy-MAPP, arc welding and inert gas-shielded arc welding and cutting equipment; power sources; electrodes and wires; Jackson arc welding accessories and safety equipment; cylinder gases and gas regulators; Aronson positioners, turning rolls, vibratory stress-relieving equipment.

Plants: Arcade, N.Y.; Belmont (Grand Rapids), Michigan; Chester, W. Va.; Cleveland, Ohio; Sparrows Point, Md.; Union, N.J.; Warren, Mich.; 28 acetylene generating plants.

Markets: Machinery and appliances, railroad and shipbuilding, metal fabricating, automotive, iron and steel, electrical equipment and electronics, aircraft and aerospace, Federal Government. These markets are served mostly through a nationwide network of several hundred franchised domestic distributors and company-owned Sales & Service Centers.

Left: *Safety glass frames assembled at the Belmont, Michigan plant of the recently acquired Aden Supply Company.* **Top Right:** *A large Aronson positioner in welding operations at Babcock & Wilcox Company in Mt. Vernon, Ohio.* **Bottom:** *Fixture, supplied by Welding Supply Corp., fabricates parts for a motor-generator set for Wheeler Corporation, Hempstead, New York.*

CX-177-S

Division sales up 12%; earnings topped previous highs; new anesthetic, Ethrane, finds excellent market acceptance

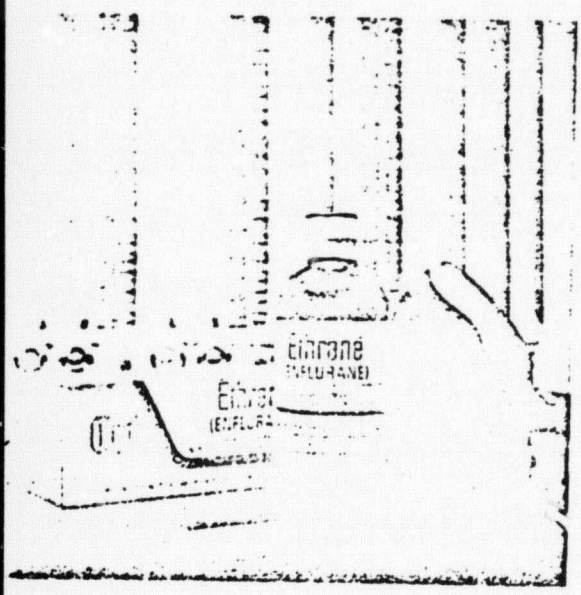
Sales of the Ohio Medical Products Division in 1972 topped the previous year by 12 per cent, achieving another record year and, in doing so, almost doubled its sales in the past five years. Although the major portion of this sales increase was generated by Ohio's traditional line of medical products—anesthesia, pediatric and inhalation therapy equipment—growth also was attained in newer product lines, such as disposable anesthesia breathing circuits and pulmonary function equipment. The division's overall strength in all these product areas was reflected in earnings, which also achieved a new high.

Ethrane approved by FDA

Climaxing many years of research and clinical testing, Ohio Medical's new inhalation anesthetic agent, Ethrane, received final approval from the U.S. Food and Drug Administration late in 1972. This new anesthetic, generically known as enflurane, has minimal biotransformation (breakdown into possible toxic products which may affect internal organs), has good relaxation properties, is nonflammable and is easy to administer.

Ohio Medical built a new plant in Cleveland, Ohio, to manufacture and package Ethrane. The facility is designed for rapid expansion to accommodate the expected market growth of this product. A highly trained sales force was developed specifically to market this anesthetic agent throughout the country. Initial sales of the product indicate a strong acceptance by the medical profession.

In addition, Ohio has licensed Abbott Laboratories—an international pharmaceutical manufacturer headquartered in North Chicago, Illinois—to manufacture and market Ethrane in all countries except Canada and the United States.



Ethrane, Ohio Medical's anesthetic agent, received final approval and packaging at its plant in Cleveland. **Left:** *An operating technician tests the vaporizer of an Ohio anesthesia machine with Ethrane.*

EX-122-T

A 4650

Sales jump registered by disposables

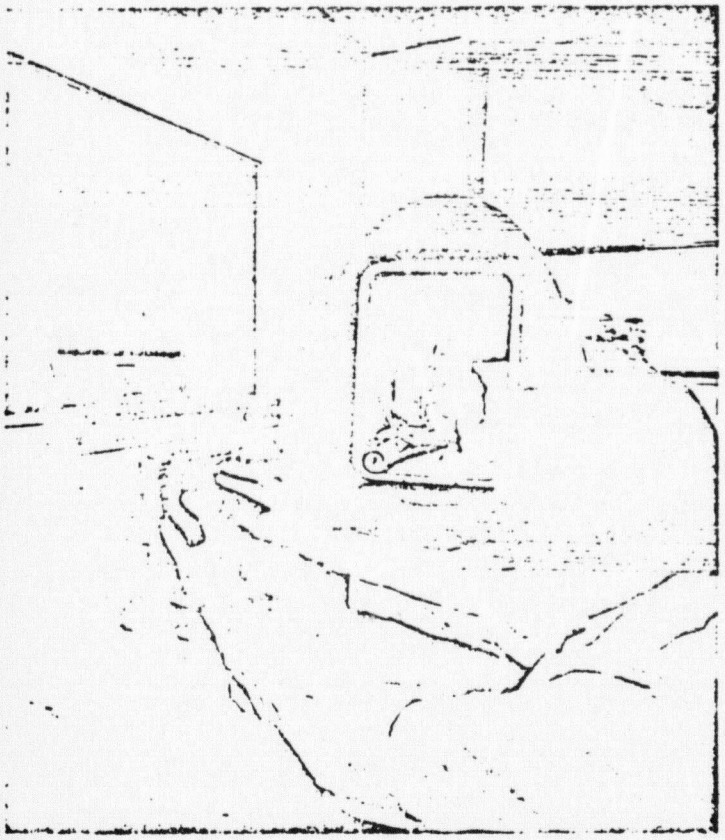
Expansion of the division's line of disposable products, particularly those related to anesthesia usage, produced a combined sales growth of 42 per cent in 1972, compared with the previous year. This growth was aided greatly by increased customer acceptance of the disposable anesthesia breathing circuit and disposable endotracheal catheter.

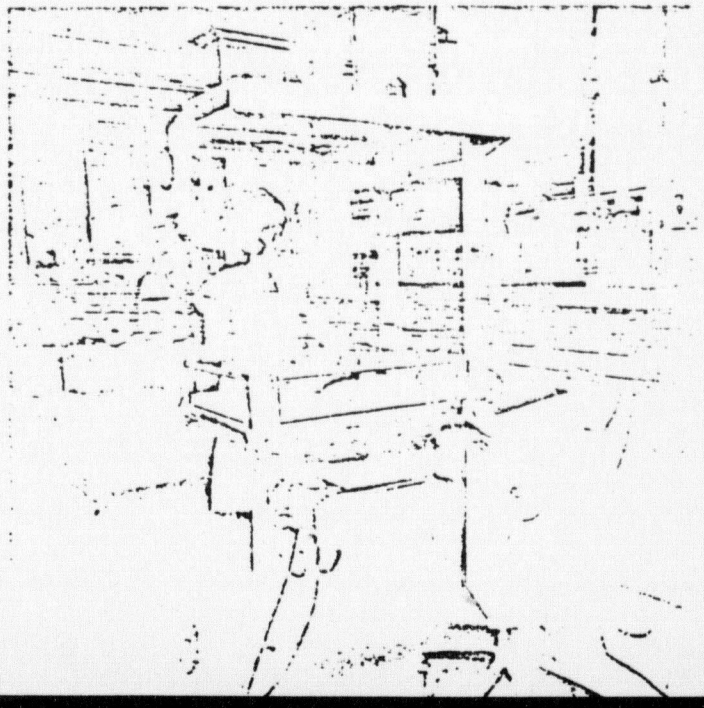
Products: Anesthetic agents and medical gases, anesthesia apparatus and accessories, inhalation therapy and resuscitation equipment, hospital medical gases and vacuum pipeline systems, infant incubators, respirators, cryosurgery equipment, pulmonary function testing equipment, modular wall systems for special patient care areas.

Plants: Berkeley, Calif.; Cleveland, Ohio; Fort Myers, Fla.; Houston, Tex.; Lodi, N.J.; Madison, Wis.; Richmond, Calif.; Toronto, Canada (Ohio Medical Products Canada).

Markets: Hospitals, clinics and nursing homes; medical and dental professions.

Below Left: *In the cardiopulmonary function testing laboratory of Hackensack (New Jersey) Hospital, a technician measures a patient's lung functions using Ohio's plethysmograph system.*
Below Right: *A nurse at Children's Hospital in St. Paul, Minnesota, cares for a newborn infant lying in an Ohio neonatal intensive care center. One of Ohio's new respirators stands in the foreground.*





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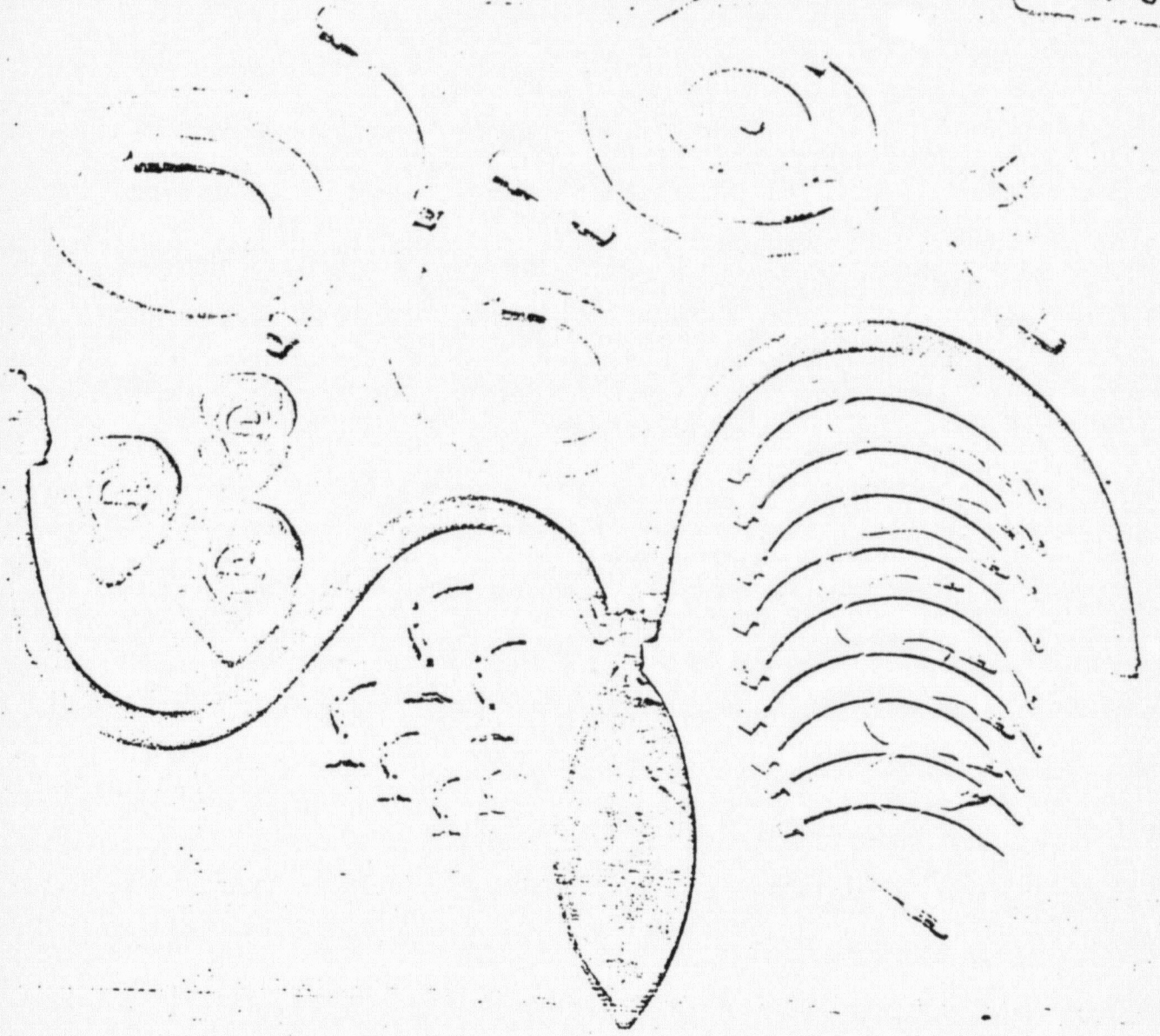
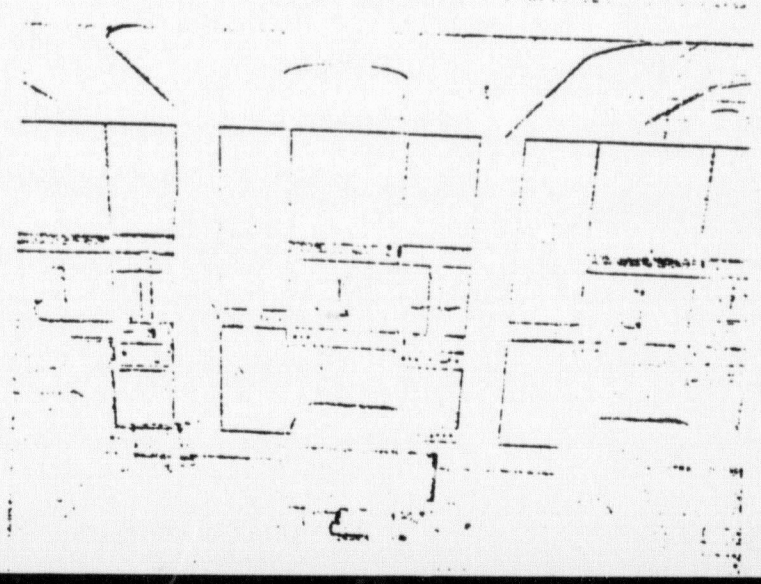


Above: *Assortment of typical disposable products—including oral airways, endotracheal tubes and anesthesia breathing circuits—manufactured by Ohio Medical at Fort Myers, Florida.* **Right:** *Ohio Medical's Multi-Wall systems, such as this one installed at Eskaton-Colusa Health Care Center, Colusa, California, are modular units used in building and remodeling patient rooms and special hospital facilities, including intensive and cardiac care areas.*



A 4652

EX-177-1/

Airco Alloys Division

A 4653

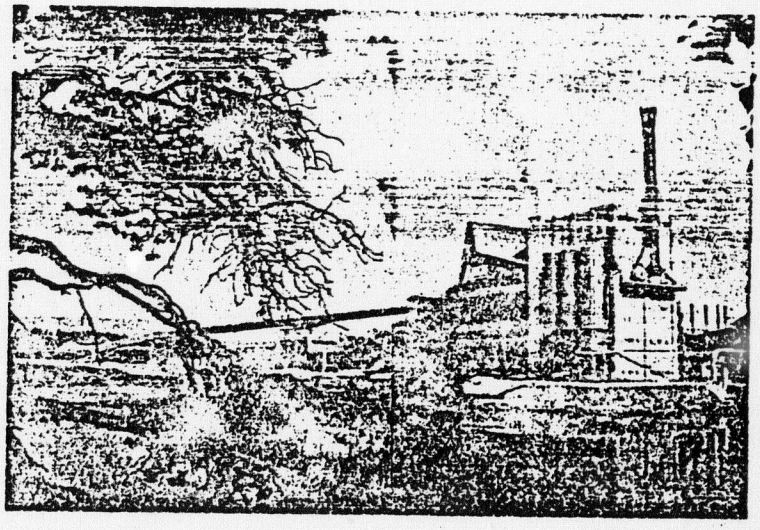
CX-177-W

Sales were up 17%, but earnings fell substantially, reflecting heavy imports of low-priced alloys and soaring power costs

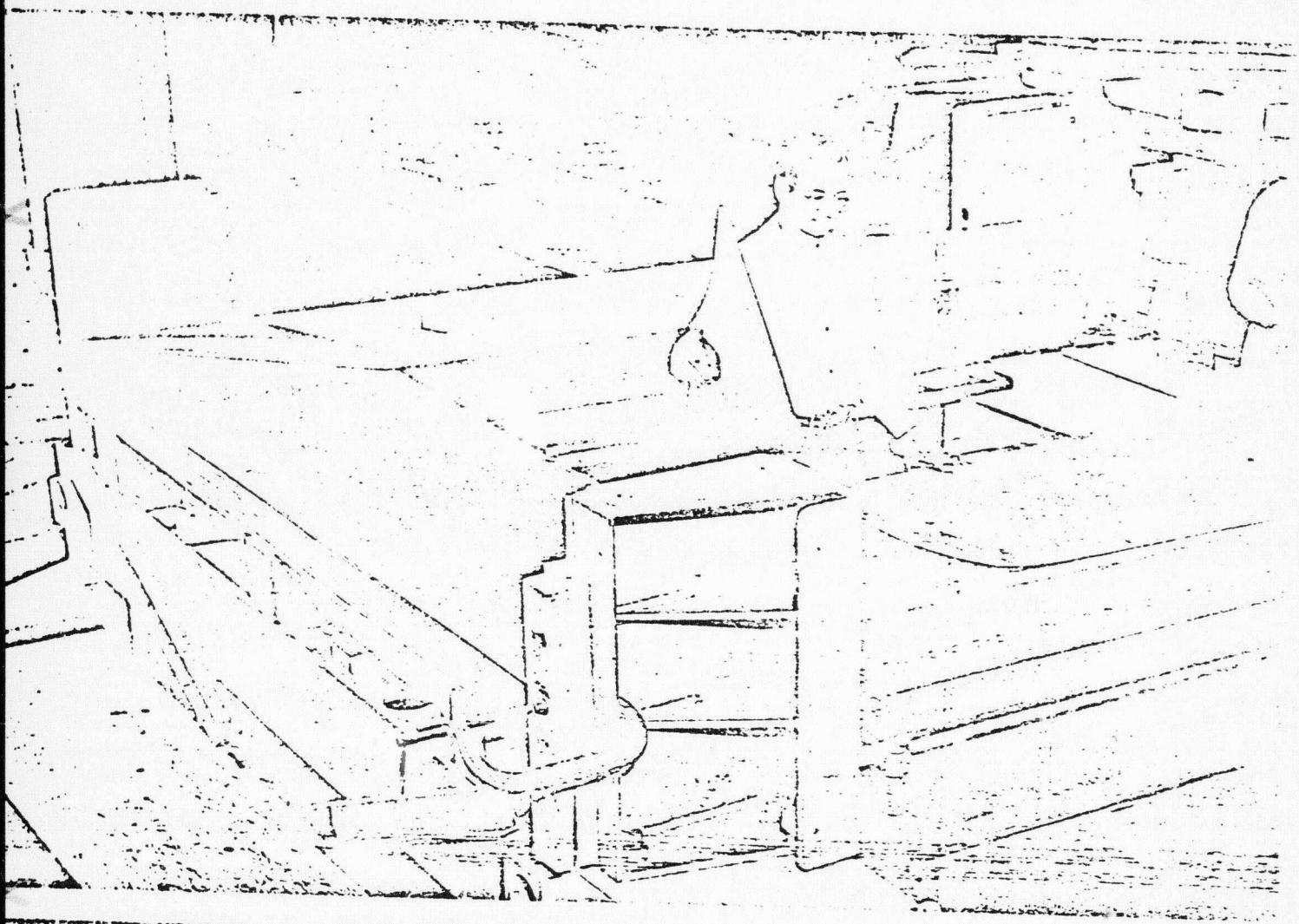
Airco Alloys had a disappointing year. Although sales showed good growth compared with 1971, earnings were down sharply. The major problem affecting the division was worldwide overcapacity of ferroalloys, which led to severe price erosion. The product hit hardest was ferrochromium—for many years the major contributor to the division's profits.

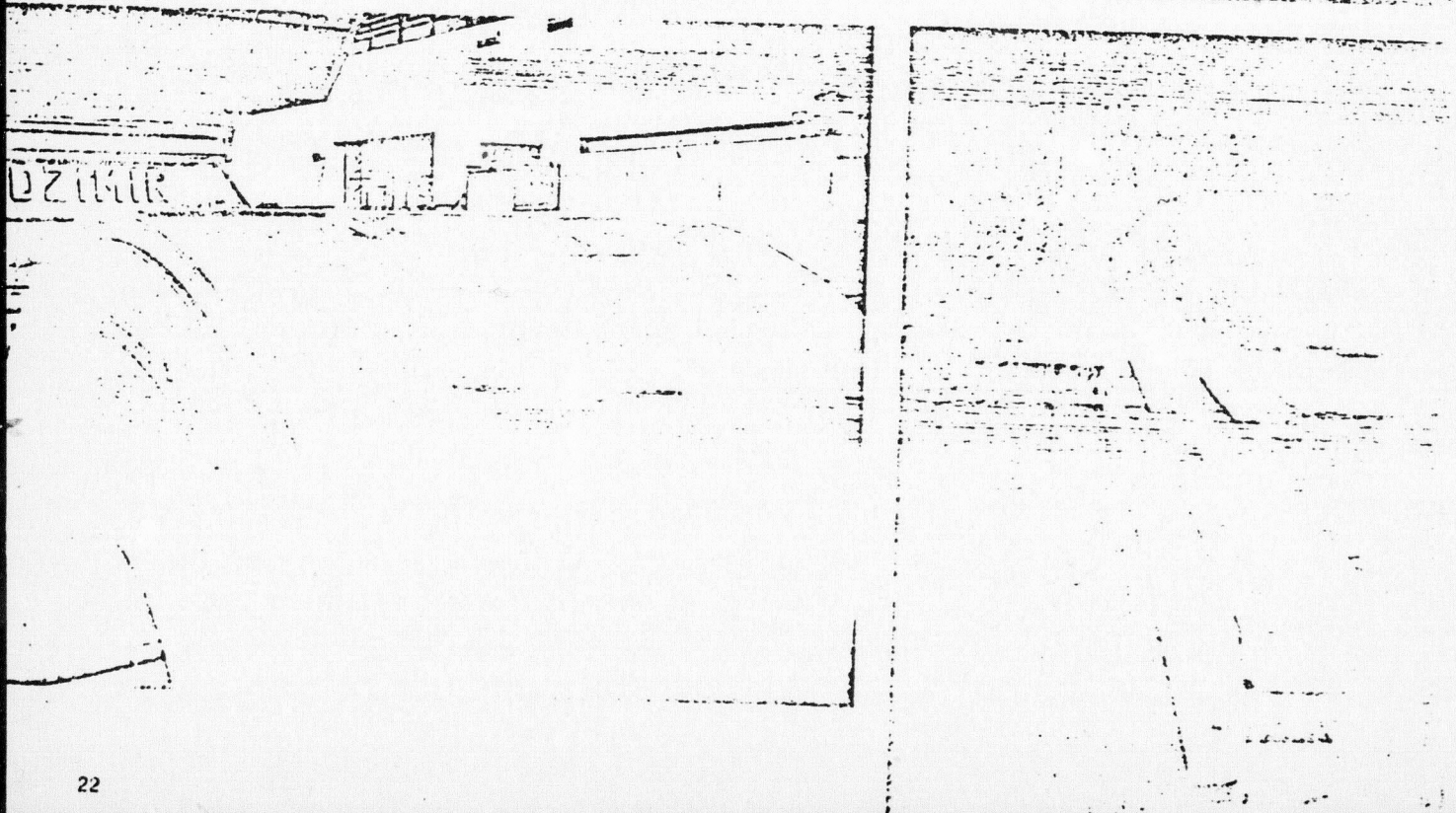
Foreign producers, particularly the South Africans, have greatly increased their production capacities for ferrochromium over the past few years. Their traditional European markets—principally stainless steel—were operating at low production levels and could not absorb the increased volume. The result was a 67 per cent increase in U.S. imports of ferrochromium in 1972 compared with the previous year.

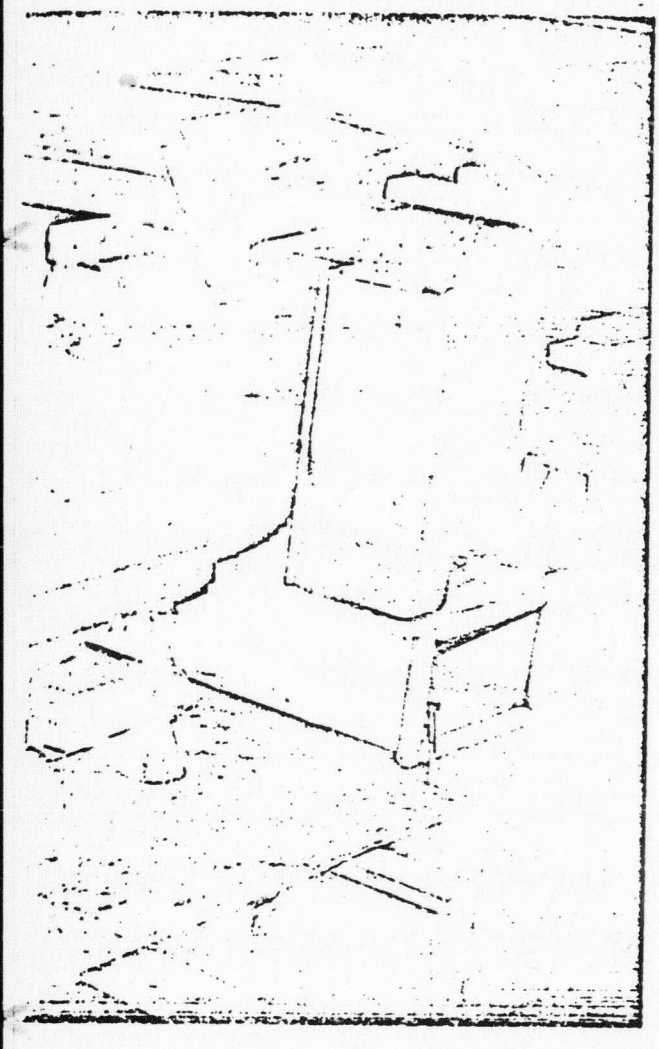
Despite strong demand for stainless steel domestically, the massive surge in imports caused an unprecedented reduction in prices. By year-end prices had dropped 20 per cent from December 1971 levels.



Far Left: *A dramatic view of the tapping operation at Airco Alloys' Niagara Falls, New York ferroalloys furnace.* **Left:** *An assortment of the major ferroalloys produced by the division. Included are ferroalloys of manganese, silicon and chromium.* **Above:** *At Vargon, Sweden, Airco Alloys AB operates the largest ferroalloys facility in the world.*







loys (such as ferrochromium, anganese and ferrosilicon) are gle most dominating factor in ng distinctive personalities to types of steel. **Far Left:** *A mas- of high-chromium-content s steel is cold-rolled at a new Steel Corporation mill in Shel- land.* **Left:** *high-strength e steel is formed into a struc- ram with the aid of a "hot saw" Homestead Works of United Steel Corporation in Pennsyl-* **Above:** *Workmen at the Pitts- field, Massachusetts plant of General Company assembly the core of power transformer with lami- nents of high-grade silicon steel.*

As the year progressed, the price erosion spread to ferrosilicon, Airco Alloys' second most important product, but not to the same extent as with ferrochrome. Furthermore, the division had to absorb substantial increases in power costs at its major ferrosilicon plant in Calvert City, Kentucky. In mid-February 1973, major producers raised prices for certain ferroalloys—a move expected to improve Airco's performance in this important market segment.

Ferroalloys furnace started up in Sweden

In June 1972, Airco Alloys AB, the company's Swedish subsidiary, brought on-stream the world's largest ferroalloys furnace at Vargon, Sweden. The 40,000-kilowatt furnace—costing $8 million to build—includes over $2 million in pollution control equipment to bring the unit into complete compliance with Swedish Government regulations.

Airco Carbide Division

Early in 1973, the carbide segment of the former Airco Alloys and Carbide Division was established as a separate division (Airco Carbide), and discontinued its manufacturing operations in Calvert City, Kentucky. The new division will continue to produce its principal products—calcium carbide and acetylene—at the Louisville plant, which will be phased out over the next several years. Extraordinary charges related to the discontinued carbide-acetylene operations are discussed in the Letter to Stockholders (pages 2 and 3).

Products: Ferrochromium, ferrochrome silicon, ferrosilicon, standard ferromanganese, low-carbon and medium-carbon ferromanganese, manganese silicide, silicomanganese, stainless steel pigs, special alloys.

Plants: Calvert City, Ky.; Charleston, S.C.; Mobile, Ala.; Niagara Falls, N.Y., Vargon, Sweden (Airco Alloys AB).

Markets: Steel, automotive, foundry, miscellaneous metals

Sales down 6%, income dipped sharply due to price competition and rising costs

A drastic price reduction in large graphite electrodes for the electric steelmaking market resulted in a six per cent decline from the record sales established in 1971 by the Airco Speer Carbon-Graphite Division. The effects of price attrition, combined with higher raw material, power and labor costs, were reflected in an appreciable decline in earnings.

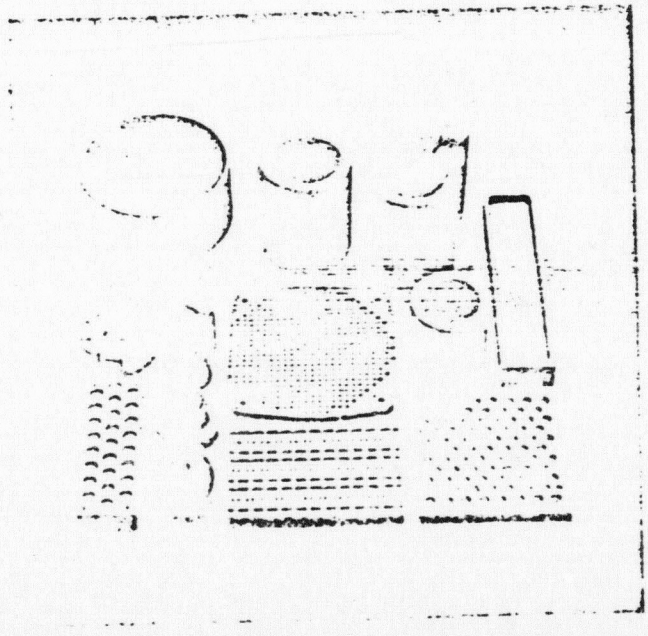
Cost control measures effective

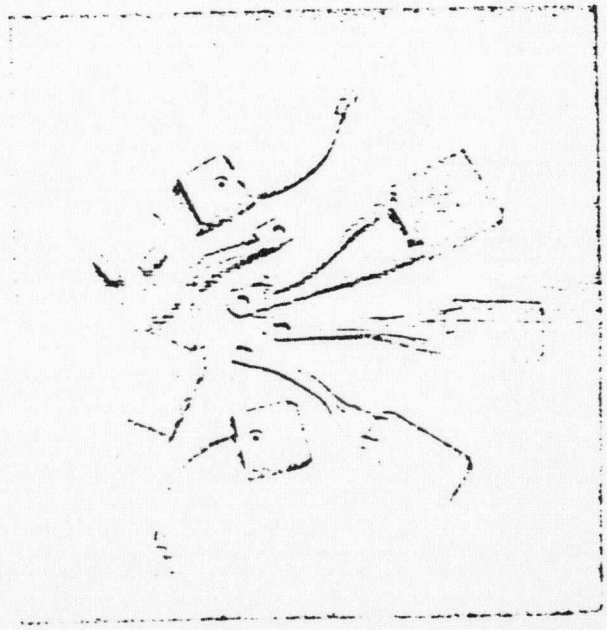
A vigorous cost control program has been implemented at all operating levels by the division, resulting in a partial restoration of profitability lost by the price cut in early 1972. Moreover, the demand for graphite electrodes, the biggest segment of the division's business, strengthened noticeably in the early part of 1973. This upsurge in demand was accompanied by a price increase.

Sales and income rose for other products

Gains were posted in both sales and earnings for product lines other than electrodes and anodes. The sales advance mirrored stepped-up demand for carbon brushes for motors and generators, gouging rods for cleaning steel castings, electrodes for electrical discharge machining applications, rocket nozzles for ordnance projectiles and a wide range of machined graphite specialties.

Graphite serves industry in a variety of ways. **Far Right:** *Airco's 24-inch premium-grade electrodes, shown in use, transmit the electrical energy to the high-temperature furnaces at the Bethlehem Steel Corporation's Steelton, Pennsylvania plant.* **Below Right:** *Carbon brushes for motors and generators help keep the nation's railroads on the move.* **Below:** *Machined graphite specialties satisfy wide-ranging uses in nuclear energy, electronics, aerospace, glass, metals and power generation.*





A 4657

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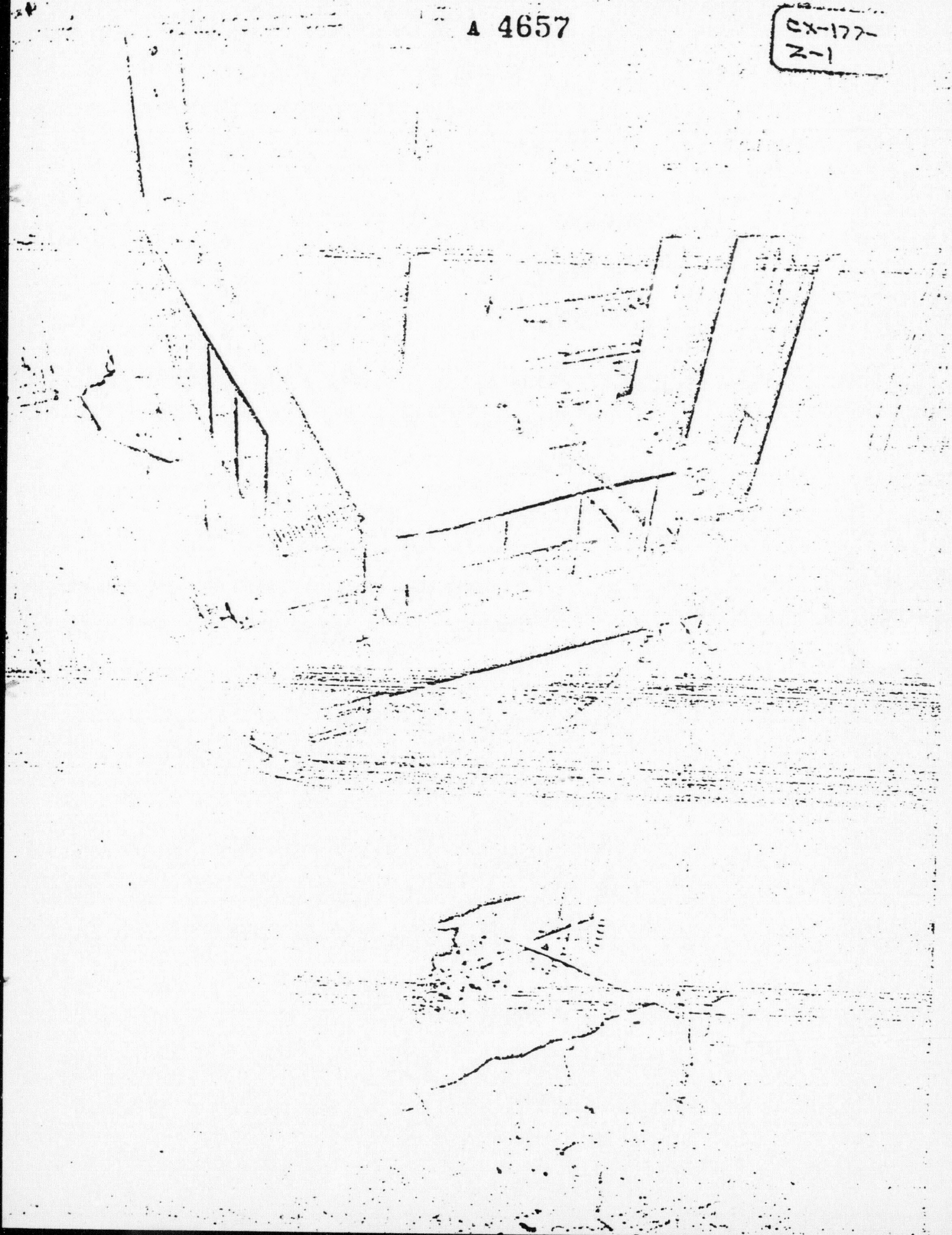
Z-1



A 4658

The favorable profit performance was achieved through intensive marketing efforts in selected markets, as well as by continuing improvements in operating efficiencies.

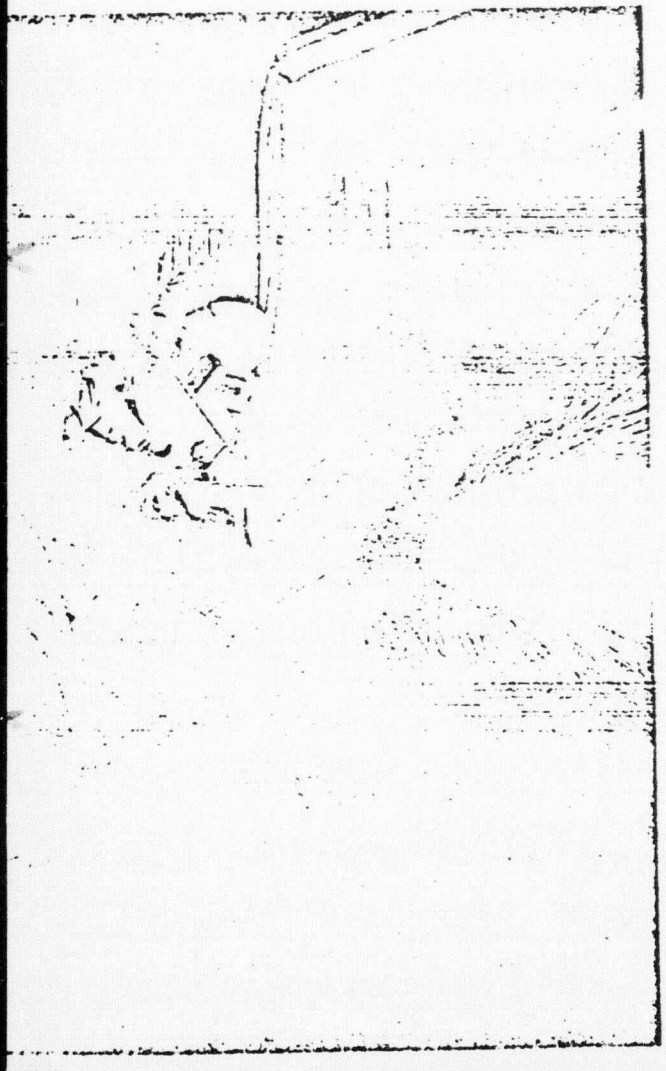
Expansion program nears completion

The division launched a multimillion dollar modernization and expansion program during 1972, anticipating strong steel industry growth in the 1970's. These new facilities, presently under construction, will increase the division's production capacity significantly when completed in 1973. The project includes the upgrading of graphitizing operations at the Niagara Falls plant by the addition of new baking furnaces. Several improvements in pollution abatement and environmental control facilities were also carried out at various plant locations during the year.

Products: Threaded graphite electrodes for steelmaking; anodes for electrolytic production of chemicals and metals; brushes for motors and generators; electrodes for electrical discharge machining; nuclear graphites; graphite welding and gouging rods; carbon battery electrodes; machined carbon and graphite molds; graphite rocket nozzles for ordnance projectiles; fixtures, specialties.

Plants: Niagara Falls, N.Y.; Punxsutawney, Pa.; St. Marys, Pa.; Montreal, Canada (Speer Carbon Co. of Canada Ltd.).

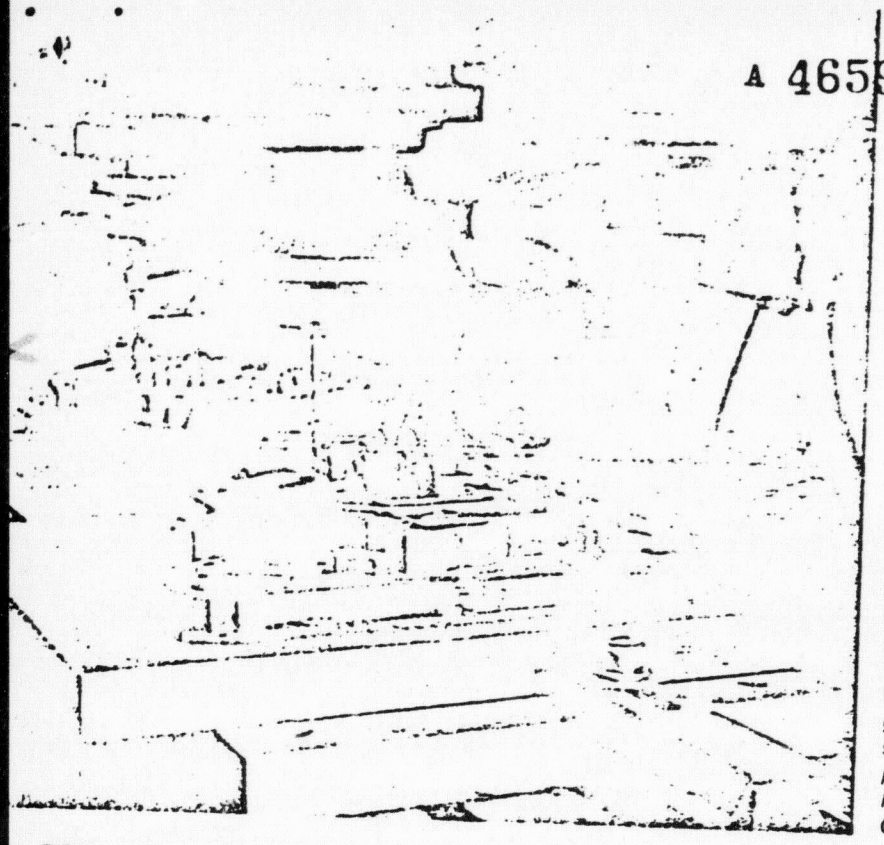
Markets: Steel, foundry, electrochemical, nonferrous metals, quartz, refractories, automotive, railway, aircraft and aerospace, electrical appliances, machine and die shops, manufacturers of dry cell batteries, Federal Government.



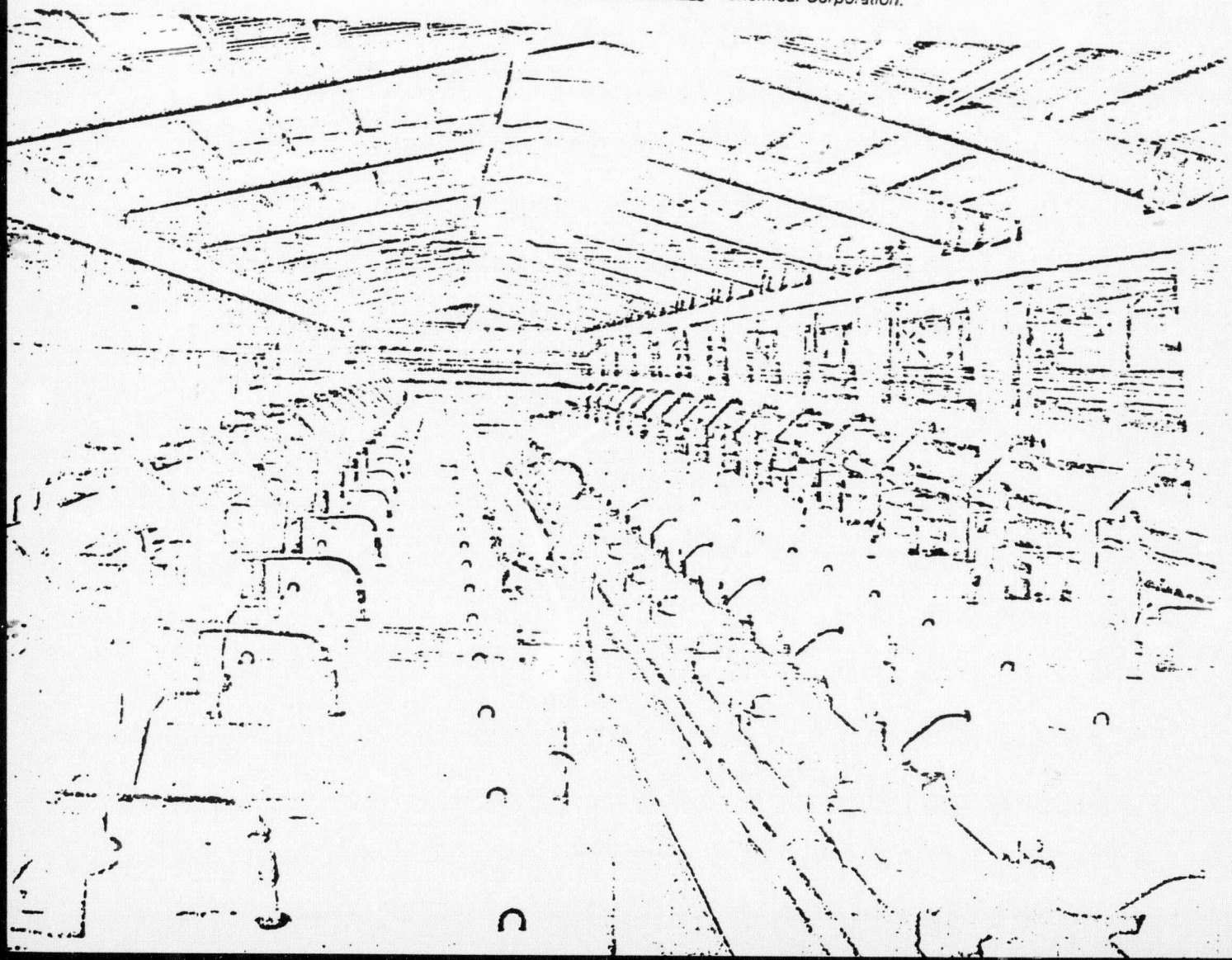
Left: *Workman removes excess metal from a steel casting with an Airco Speer Kostkutter gouging rod at the Quaker Alloy Casting Company foundry in Myerstown, Pennsylvania.*

A 4659

CX-177-
2-3



Left: *Versatile graphite is shaped into an electrode for electrical discharge machining of a die for a precision automotive part at Primeway Tool Company in Detroit.*
Below: *Current-carrying graphite anodes decompose salt brine in the electrolytic production of chlorine at the Niagara Falls plant of Hooker Chemical Corporation.*



Airco Speer Electronics Division

A 4660

EX-177-
2-4

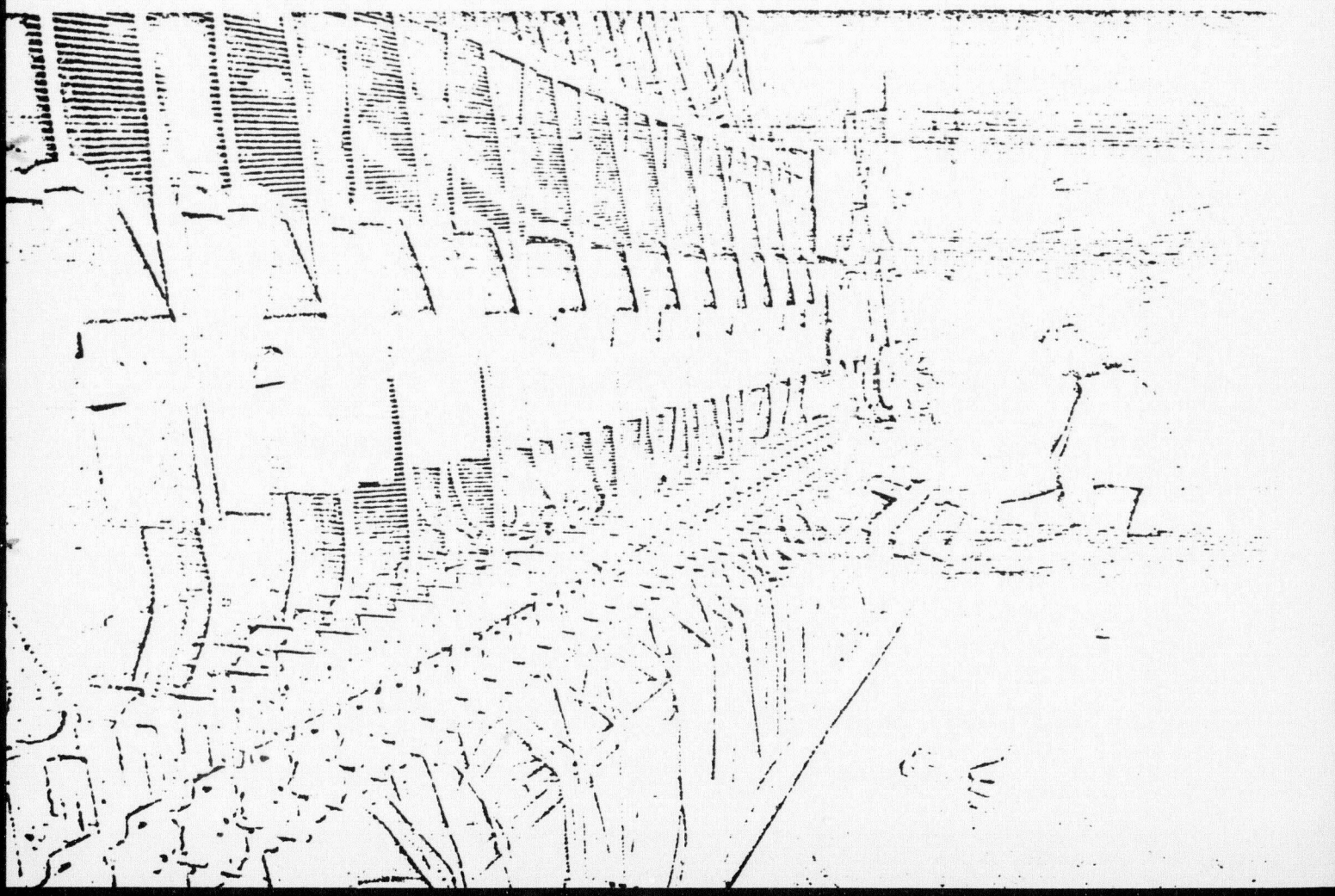
Sales climb 39% to near-record high; income rose as markets rebounded

The Airco Speer Electronics Division overcame continued price erosion in the domestic electronics industry throughout 1972 to achieve the second highest sales year in its history. A resurgence in computer, communications and home entertainment markets resulted in a 39 per cent increase in sales over 1971. Production records were set in every product area—led by a strong performance in resistors and special components.

Significant earnings turnaround attained

A turnaround in earnings—from a loss in 1971 to an appreciable profit in 1972—was attributable to higher domestic and overseas sales volumes, new market development, higher operating efficiencies and effective cost controls.

Below: *Airco Speer resistors are shown here being arranged automatically—according to size and predetermined sequence—before assembly onto duramodule "carriers" at Zenith Radio Corporation's facility in Chicago, Illinois.*



A 4661

Ex-177-
2-5

Expansion enhanced market postures

Worldwide sales increased sharply in 1972, and now form an important part of the division's overall business. Overseas operations were further bolstered by the completion of a 50,000-square-foot addition to the two-year-old Singapore plant. A new thin-film facility at Bradford, Pennsylvania, when completed in mid-1973, will provide increased penetration into the high-growth industrial electronics markets.

Products: Fixed composition resistors and capacitors, radio frequency choke coils, thick- and thin-film and carbon-film resistors.

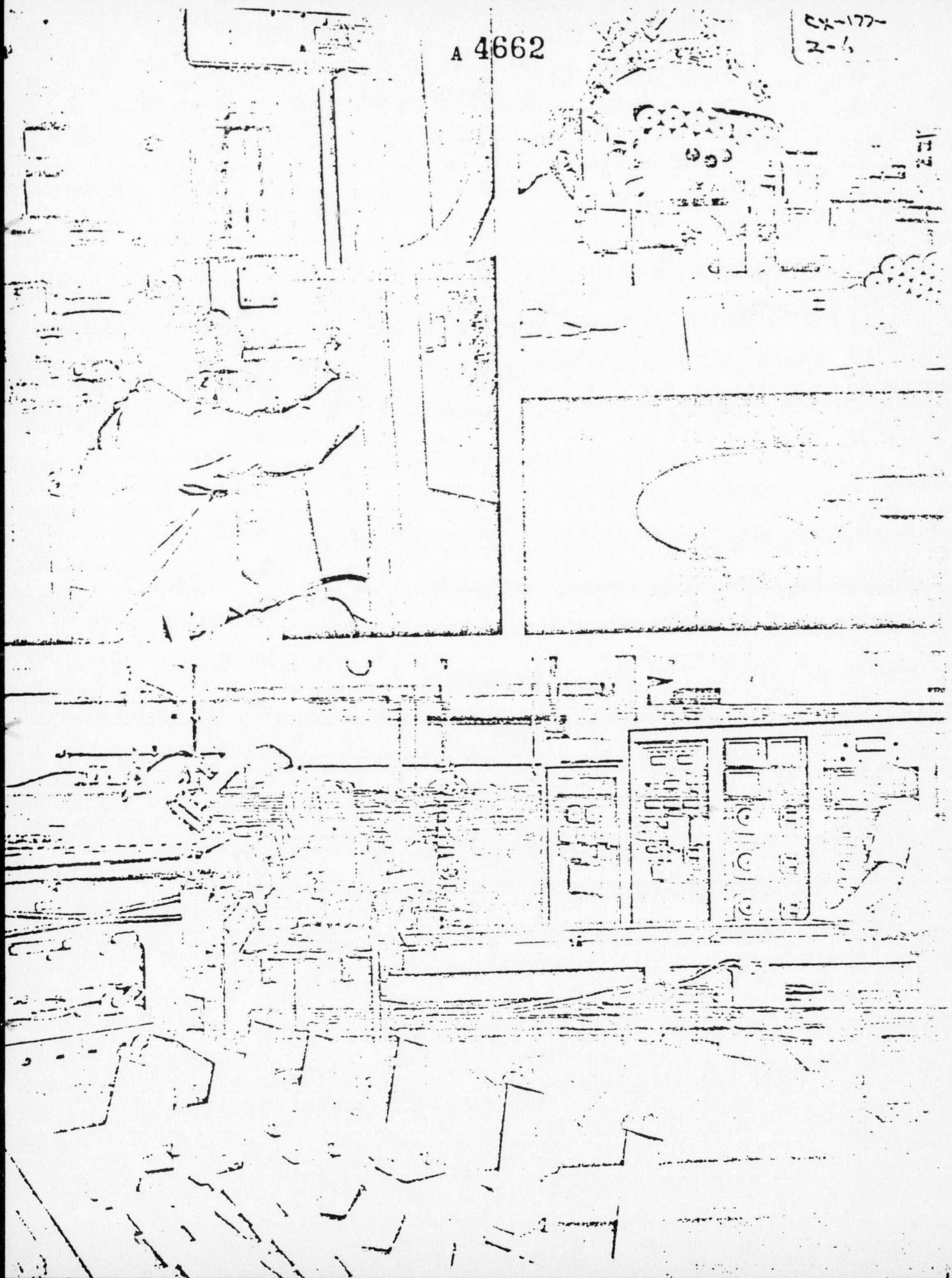
Plants: Bradford, Pa.; Nogales, Mexico (Airco de Mexico S.A. de C.V.); Singapore (Airco Singapore Pte. Ltd.)

Markets: TV and radio, electronic data processing equipment, industrial instruments, military electronic apparatus.

Below: *Speer resistors are also an integral part of Hammond organs produced at the world-famed company's plant in Chicago.* **Bottom:** *They are important also in the circuitry for International Telephone & Telegraph's new all-solid-state private automatic branch exchange (PABX) system and* **Right,** *in the chassis of color televisions made at the Covington, Tennessee plant of Warwick Electronics, Inc., which supplies one of the country's largest department store chains.*

A 4662

Ex-177-
2-1



A 4663

Sales climbed 14%, but earnings were relatively unchanged during the first half of year

The Airco Temescal Division's market success continued throughout 1972, but profitability was essentially stable. In the second half, newly introduced manufacturing efficiencies raised earnings to a higher level.

Coating operations and new coater contributed to increased sales

Two product areas provided the main thrust for higher sales in 1972—the Berkeley, California evaporated-coating installation, serving the jet engine industry, and the excellent acceptance of Temescal's new fast-cycle coater, the FC-1800, introduced in late 1971.

In addition, an improved market for the division's standard off-the-shelf products used in electron-beam, high-vacuum coatings of electronic components, alloys, glass and optical lenses contributed to profitability.

Products: Integrated high-vacuum electron-beam (EB) systems and components, high-vacuum valves, turbomolecular and titanium sublimation pumps, power supplies, EB guns and related monitoring equipment, transformers, processing of special materials in EB furnaces, thin-film production systems, coating systems for decorative and functional plating, bell-jar and fast-cycle coaters and sputtering modules.

Plant: Berkeley, Calif.; warehouse in Amsterdam, the Netherlands (Airco Temescal B.V.)

Markets: Steel, alloys, electronics, optical, aircraft, glass, Federal Government.

Top Left: *Airco Temescal's turbomolecular vacuum pump installed on an ion accelerator at Lawrence Research Laboratories, University of California, Berkeley.*

Top Right: *Planetary holder plating microelectronic substrates is set up at Temescal's customer applications laboratory.*

Center Right: *Close-up photo of an electron beam evaporating aluminum was taken in the showroom of Temescal's exclusive Japanese agent, Hakuto, in Tokyo.*

Bottom: *Overall view of coating installation, primarily serving Pratt & Whitney Aircraft, at Temescal's Berkeley plant. After coating, jet engine vanes and blades (compound) yield longer life and greater fuel-burning efficiency.*

A 4664

CX-177-
2-2

Losses reduced, but conversion-distribution problems penalized sales; prospect further improvement based on solid sales gain

During 1972, the Airco Vacuum Metals Division continued to build inventories of standard mill forms of E-Brite 26-1, a revolutionary, ultrapure stainless steel, which has superior corrosion resistance and other advantageous properties.

This planned conversion of E-Brite 26-1 into mill forms fell significantly behind schedule because the eight specialty steel mills engaged in the conversion programs were unable to keep conversion schedules, attain predicted yields and maintain consistent tight quality controls. However, in recent weeks the conversion schedule has been speeded up as a result of the persistent efforts of technical troubleshooters from the division and our Central Research Laboratory.

E-Brite 26-1 proves ideal for use in several key specialty products

Customer confidence and interest continued to grow throughout 1972 as increasing quantities of E-Brite 26-1 proved ideal in actual service as heat exchanger material and as piping and tubing in corrosive environments.

The division will continue to concentrate on attaining the significantly higher volume of sales needed to improve results. It is expected that Airco Vacuum Metals will operate at a loss during 1973, but at an improved level compared with 1972. At the end of 1972, Airco's total investment in facilities and inventories for this project was three per cent of the company's total assets.

Left: *A glowing ingot of E-Brite 26-1 is upended for transfer to the cooling area at the Airco Vacuum Metals plant in Berkeley, California.*
Bottom Left: *Control panel for the Electron Beam Hearth Refining furnace in Berkeley.*
Bottom Center: *Various diameters of E-Brite 26-1 tubing stocked at R. J. Gallagher Company, the division's distributor in Houston, Texas.*
Below: *Chemical digester tank, formed from E-Brite 26-1 plates, being welded for Dow Chemical Company by Northwest Copper Works, Portland, Oregon.*

Products: Electron-beam hearth refined stainless and special products in the form of cast slabs and blooms, sheet, strip, bar, billet, wire and stock suitable for converting into tubing and pipe.

Plant: Berkeley, Calif.

Markets: Chemical process, petroleum refining, pulp and paper, power, desalination and water treatment, shipbuilding and marine, food processing

Airco Viking Division

A 4666

EX-177-
R-10

Sales, up 8%, and earnings rose substantially to record highs; major plant expansion completed at Verdi, Nevada facility

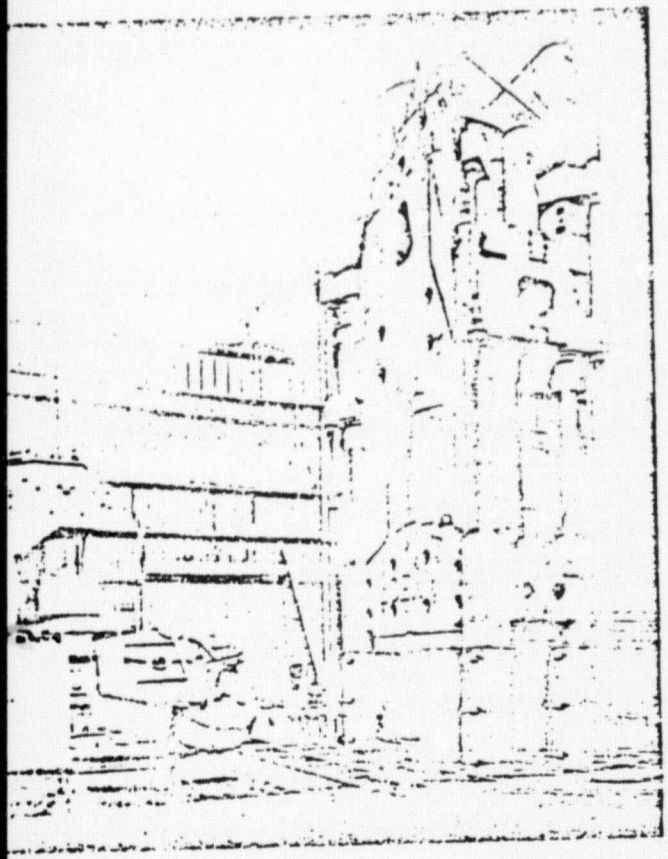
The Airco Viking Division—buoyed by improved manufacturing processes and materials handling systems, and greater demand for its line of ring-mill and forged metal products—attained new sales and earnings records in 1972.

Nevada plant enlarged

At year-end, the division completed its 30,000-square-foot addition to the Verdi, Nevada plant. A great portion of this new space is being devoted to the production of new types of extrusions and forgings, principally high-strength alloy, nickel-base alloy and titanium shapes and sections.

The expanded plant also has been outfitted with the most sophisticated cogging press equipment for the conversion of titanium and nickel-base ingots to billets, the first such service conveniently available to West Coast producers.

Below: *Massive cogging press was installed late last year in the expanded Verdi, Nevada plant.*
Bottom: *Quality-control engineer inspects titanium jet engine rings produced for Pratt & Whitney Aircraft.*



Products: Seamless roll-forged rings, press and hammer forgings, extrusions and extruded-type forgings, crane mill parts, custom rolled and swaged bar—produced in titanium, nickel-base and refractory alloys, stainless steels, aluminum, alloy steels, copper alloys.

Plants: Albany, Calif.; Verdi, Nev.

Markets: Gas turbine, aerospace, machinery, electronics, petrochemical, nuclear.

Right: *Numerous [illegible] forgings made [illegible] Airco's plant [illegible] produced [illegible] Agena's Short Range Attack Missile [illegible] installed in [illegible] of a B-52 strategic*

A 4667

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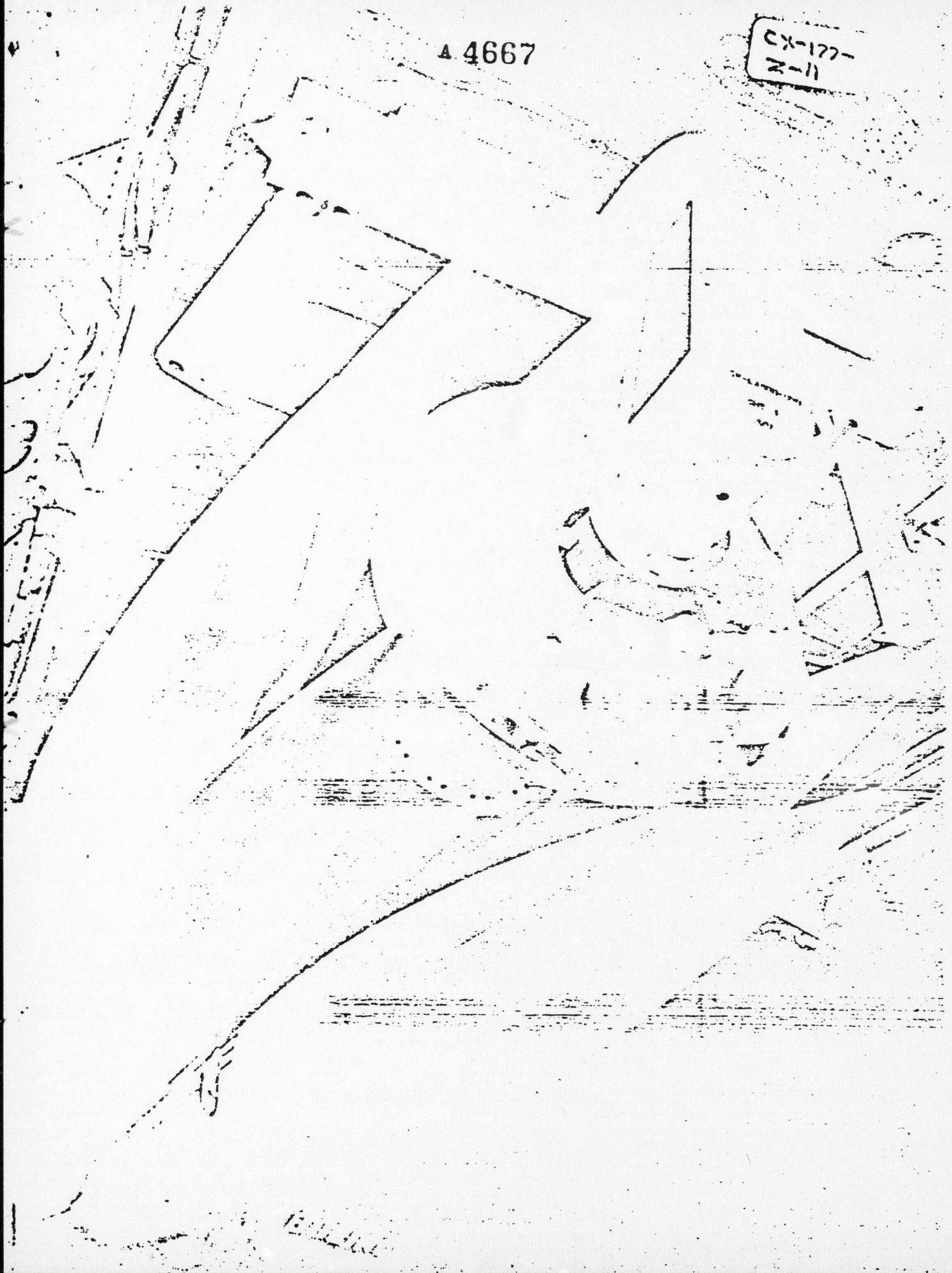
2-11



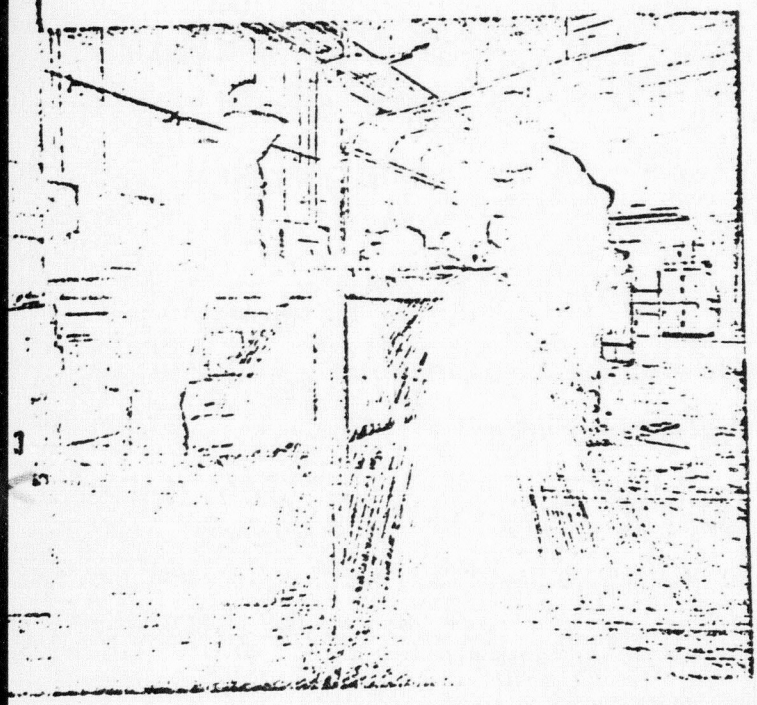
Employee Relations and Training

A 4668

Employment increased 3.8% in 1972; minority levels held in corporate move

At the end of 1972, there were 13,055 office and plant personnel employed by Airco in its foreign and domestic operations—a 6.3 percent increase over 1971. Much of this increase was in our Singapore electronics plant which was expanded appreciably. There were 31 collective bargaining agreements negotiated last year without a work stoppage. One agreement was settled satisfactorily after a 30-day strike.

Below: *Oxy-fuel metal cutting is one of the skills taught at the new Airco Technical Institute in Baltimore, Maryland.*
Bottom: *The 1972 management training course, attended by 26 members of mid-management, emphasized financial and human resources supervision.*

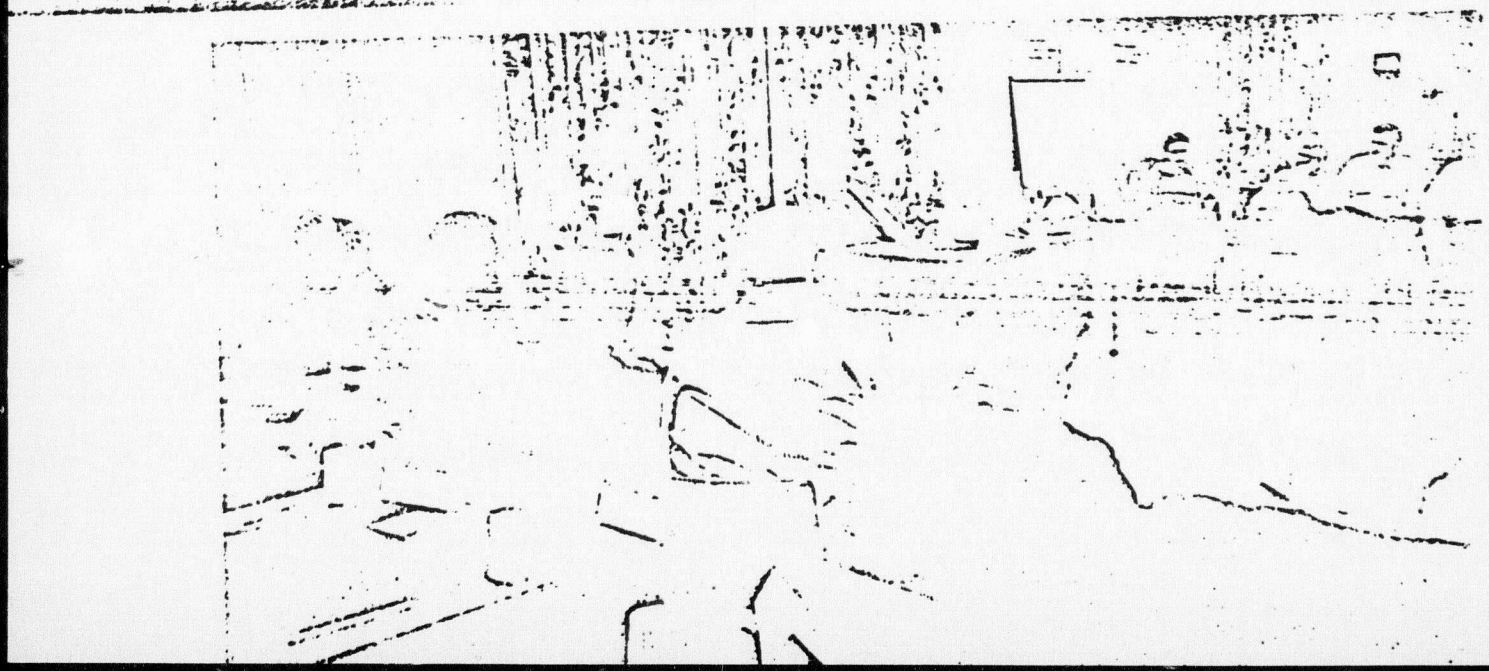


Corporate minority employment maintained

A significant achievement in Airco's move from New York City to Montvale was the maintenance of the 12 per cent minority group employment level in our corporate offices—the result of a vigorous recruitment program.

New training center in Baltimore

In 1972, the company opened the Airco Technical Institute in Baltimore, Maryland, thereby expanding its commitment to teach welding skills to unemployed and underemployed persons. The program, which also includes schools in Cleveland and New York, has now graduated more than 1,000 persons and placed them in well-paying jobs.



A 4669

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51 Five-Year Financial Summary

Sales and Earnings by Product Line*

(Dollar Amounts in Millions)

A 4670

EX-177-2-14

	Sales 1972		Sales 1971		Earnings(1) 1972		Earnings(1) 1971	
	$	%	$	%	$	%	$	%
Industrial Gases; Cryogenic, Welding and Cutting Equipment	240.0	48.7	192.3	46.7	26.8	60.8	21.1	44.1
Ferroalloys	130.0	26.1	103.7	25.2	8.3	8.3	13.0	27.1
Carbon, Graphite, Electronics and Metals	91.3	18.5	77.3	18.8	7.2	16.3	8.0	16.7
Medical Gases and Equipment	32.7	6.7	38.1	9.3	5.2	11.8	5.8	12.1
Total	492.3	100.0	411.4	100.0	44.1	100.0	47.9	100.0

(1) Before income taxes, interest and corporate expense.

Sales and Net Income Per Share by Quarter*

	Sales (Millions of Dollars)		Net Income Per Share	
	1972	1971	1972	1971
1st Quarter	$119.5	$105.0	$ .80	$ .44
2nd Quarter	127.0	105.6	.50	.43
3rd Quarter	110.7	95.2	.29	.24
4th Quarter	135.1	105.6	.24	.44
Total for the Year	$492.3	$411.4	$1.83	$1.55

Where the Sales Dollar Went in 1972

Materials and Services	51.9¢
Payrolls	23.0¢
Depreciation	5.4¢
Taxes	4.0¢
Dividends Paid	9.8¢
Retained Earnings	1.7¢

*Continuing Operations.

1972 Sales to Industries*

A 4671

CX-177-
2-13-

33.3% Steel Mills and Foundries

13.3% Machinery

[illegible] Medical, Dental and Personal Care

[illegible] Trades and Services

7.1% Electrical Equipment and Electronics

3.8% Industrial Chemicals

3.6% Aircraft, Space and Defense

2.3% Foods and Beverages

2.2% Transportation (except Highway)

2.1% Metal Fabricators

1.5% Motor Vehicles

1.0% Government and Education

[illegible] Nonferrous Metals, Glass and Other Industries

*Continuing Operations.

Statement of Accounting Policies

Ex-177-
Z-14

A 4672

The accounting policies followed by Alcoa in maintaining financial records and preparing financial statements are set forth below:

Principles of Consolidation The financial statements include the accounts of all domestic and foreign subsidiaries of Alcoa and the equity in the underlying net assets of significant affiliated companies when Alcoa's ownership is in excess of 20%.

Inventory Pricing Inventories are valued at the lower of average cost or market.

Depreciation and Depletion Allowances for depreciation and amortization are accumulated generally on a straight-line basis. Alloy's production equipment acquired after January 1, 1971 and electron-beam production facilities are depreciated on the units of production method.

Goodwill, Patents and Trademarks Goodwill is amortized on the straight-line basis over a period of 40 years. Patents and trademarks are valued at $1 for financial statement purposes; related costs are written-off in the year incurred.

Income Taxes Income taxes are provided in the year transactions enter into the determination of net income regardless of when such transactions are recognized for tax purposes. Accordingly, income taxes affecting payments in future years are included in Deferred Income Taxes. Investment tax credits are included as reductions of income tax expense in the year the credits arise.

Research and Development Costs Expenditures for research and development are charged to operations in the year incurred.

Translation of Foreign Currencies Current Assets and Current Liabilities of foreign subsidiaries are translated into U.S. dollars at the exchange rate in effect at the reporting dates. Long-Term Assets and Liabilities and Stockholders' Equity are translated at the rates of exchange in effect when acquired, incurred or issued. Translation gains are included in a reserve account. Realized gains and losses are reflected in Net Income.

A 4673

EX-177-2-17

Acquisitions and Disposition During 1972, in transactions accounted for as purchases, Airco acquired four welding product supply companies for 35,292 treasury shares of Airco, Inc. Common Stock having a fair market value of approximately $606,000 and approximately $453,000 in cash.

In January 1971, Airco purchased substantially all of the outstanding stock of Electro/Systems, Inc., a manufacturer of multi-purpose hospital wall units, for a total consideration, including certain payments to creditors, of approximately $900,000 in cash.

The operations of the above mentioned companies have been included in the consolidated financial statements from the dates of acquisition.

During 1971, Airco issued 49,430 shares of its Common Stock in exchange for 100% of the outstanding shares of Jackson Welding Supply Co., an independent distributor of welding and cutting equipment, in a transaction accounted for as a pooling of interests. The operations of this company are included from January 1, 1971.

As of September 30, 1971, Airco and British Oxygen Company terminated the venture originally established in 1967 to market, design and construct low-temperature plants on a worldwide basis. Airco, BOC, the United States based portion of the venture, is now operated as a wholly-owned subsidiary of Airco under the name Airco Cryoplants Corporation. The operations of Airco Cryoplants Corporation have been included in the consolidated financial statements from October 1, 1971.

The operations, for the current and prior periods, of the companies mentioned above, are not material in relation to the consolidated sales and operations of Airco.

On January 24, 1973, Airco announced the discontinuance of the carbide-acetylene business. The net result of this transaction was accounted for at the end of 1972 as set forth on page 44 under Discontinued Operations and Extraordinary Item.

Foreign Operations At December 31 and for each year then ended, the net assets, sales and income of consolidated foreign subsidiaries were:

	1972	1971
Net Assets	$ 25,621,000	$ 21,445,000
Net Sales	$ 35,587,000	$ 25,350,000
Net Income	$ 2,692,000	$ 2,126,000

Inventories The inventories at December 31 included:

	1972	1971
Finished Goods	$ 73,450,000	$ 55,150,000
Goods in Process	31,086,000	23,766,000
Raw Materials and Supplies	50,577,000	41,638,000
Total Inventories	$155,113,000	$120,554,000

Property, Plant and Equipment Capital expenditures during 1972 aggregated $40,500,000, up from the $32,000,000 spent in 1971. Depreciation and amortization, applicable to continuing operations, amounted to $24,700,000 in 1972 and $23,200,000 in 1971.

A 4674

EX-172-
2-18

Long-Term Receivables Long-Term Receivables include amounts due in connection with the disposition of property in 1970 and early 1971 and will be collected over a seven-year period ending in 1979. The total amount of $9,600,000 at December 31, 1972 and 1971 has been discounted by $2,320,000 at the end of 1972 and $2,935,000 at the end of 1971 based on the then prevailing interest rate imputed at 9.5%.

Long-Term Debt Following are the amounts payable annually during the five-year period ending December 31, 1977. Included in the 1977 amount payable are the sinking fund payments on the 3½% Convertible Subordinated Debentures:

1973	$ 2,660,000
1974	5,777,000
1975	5,767,000
1976	36,239,000
1977	20,601,000

Subject to certain limitations and payment of premiums, prepayments on all long-term debt may be made. Of the Total Long-Term Debt of $177,325,000 at December 31, 1972, $3,426,000 is repayable in foreign currency.

Notes payable to domestic banks amounting to $84,500,000 at December 31, 1971 were refinanced in 1972. Under the 1972 agreement, domestic banks are committed to lend $50,000,000 to Airco through July 31, 1975, all of which had been borrowed and was outstanding at December 31, 1972. Repayment of these notes is required to be made in equal semi-annual installments over a four-year period beginning on January 31, 1976. The notes bear interest at the best rate established, from time to time, by The Chase Manhattan Bank (National Association), one of the participating banks, until July 31, 1973 at which time the interest rate will be ¼% above the best rate in effect from time to time until July 31, 1975, and thereafter at ½% above the best rate in effect from time to time.

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payments of cash dividends and the purchase, redemption, or retirement of Airco's capital stock. As of December 31, 1972, under the most restrictive of these provisions, the amount available for such purposes was approximately $29,000,000.

Capital Stock Capital stock of Airco consists of the following shares:

Type of Capitalization	Authorized	Shares Outstanding 1972	Shares Outstanding 1971
Preferred Stock, $5 par value	1,000,000	—	—
Common Stock, $1 par value, net of shares held in treasury of 3,506 (1972) and 17,963 (1971)	20,000,000	11,765,233	11,668,404

Common Stock reserved for issuance is as follows:

Reserved For	Shares 1972	Shares 1971
Conversion of Debentures at $31.25 a share through 1987	1,016,384	1,016,384
Stock Option and Purchase Plans	533,823	247,656

BEST COPY AVAILABLE

EX-177-2-19

A 4675

Stock Option and Stock Purchase Plans Under Airco's stock option plans, shares of Common Stock have been made available to certain key employees of Airco at the fair market value at the date the options were granted.

A summary of option data for 1972 and 1971 is shown below:

	1972		1971	
	Number of Shares Under Option	Aggregate Option Price	Number of Shares Under Option	Aggregate Option Price
Outstanding, January 1	133,148	$3,237,000	136,198	$3,632,000
Granted	8,000	160,000	33,000	653,000
Exercised	(198)	(3,000)	(1,600)	(28,000)
Terminated	(20,950)	(586,000)	(40,750)	(1,220,000)
Outstanding, December 31	120,000	$2,808,000	133,148	$3,237,000
At December 31:				
Exercisable	61,600	$1,629,000	51,543	$1,434,000
Available for Grant	29,762		16,312	

The employee stock purchase plan entitles eligible employees to purchase unissued Common Stock or shares held in treasury at 85% of the closing market price of the Common Stock at certain quarterly dates. Through December 31, 1972, an aggregate of 415,936 shares (for consideration of $6,684,000) have been purchased.

Federal and Foreign Taxes on Income Federal and Foreign Taxes on Income includes provisions applicable to continuing operations as follows:

	1972	1971
Current Income Taxes	$ 3,397,000	$ 1,679,000
Deferred Income Taxes	7,618,000	12,602,000
Investment Tax Credit	(1,759,000)	(868,000)
Total Provision for Taxes	$ 9,256,000	$13,413,000

Deferred Income Taxes arise due to differences between reported and taxable income relating to accelerated methods of depreciation, allowances for estimated losses on facility abandonments and certain deferred costs. Generally, Airco provides for additional taxes that might result from the distribution of its foreign subsidiaries' and affiliates' unremitted earnings.

The total tax provision is less than would result from application of United States tax rates because of the investment credit and the fact that taxes have not been provided on unremitted earnings of certain foreign subsidiaries whose earnings are to be reinvested in plant expansion, working capital and payment of foreign long-term debt. The total of such foreign earnings included in consolidated retained earnings is not material.

EX-177-
2-20

Discontinued Operations and Extraordinary Item. The discontinuance of the carbide-acetylene business resulted in an extraordinary charge of $16,000,000 (net of related tax benefits of $14,740,000) based on estimated costs in connection with the fulfillment of commitments, the termination of operations and the disposition of the carbide-acetylene plant assets. The related estimated liabilities are included in Current Accruals and Miscellaneous Other Liabilities. The net sales and related expenses, including income tax effects, applicable to the discontinued operations have been excluded from the respective captions in the Statement of Consolidated Income for both 1972 and 1971 and have been shown net under the caption "Income From Discontinued Operations". Net sales relating to discontinued operations were $25,894,000 in 1972 and $29,153,000 in 1971.

Earnings Per Share of Common Stock. Earnings Per Share of Common Stock are based on the weighted average number of shares of Common Stock outstanding during the respective years. Dilution from common stock equivalents (certain shares issuable under stock option plans) is not significant.

Fully Diluted Earnings Per Share recognizes the potential exercise or purchase of common stock equivalents, and the assumed conversion of the 3¾% Subordinated Debentures. For the purpose of this calculation, Net Income is adjusted to reflect elimination of interest and issue expense, net of income taxes, relating to the assumed conversion of the debentures.

Retirement Plans. Airco and its subsidiaries maintain retirement plans covering substantially all officers and employees. It is Airco's policy generally to fund the pension cost accrued. The value of vested benefits based on actuarial determinations is substantially funded. The total pension expense for the years ended December 31, 1972 and 1971 was approximately $3,742,000 and $2,997,000, respectively, the increase resulting principally from improved benefits.

Commitments. The unexpended portion of amounts authorized for capital expenditures at December 31, 1972 approximated $14,517,000 as to which commitments have been made for approximately $3,938,000.

Annual rental payments for all leases extending beyond one year, approximated $13,300,000 at December 31, 1972. Of this amount, $1,800,000 pertains to warehouse and office rentals and $11,500,000 pertains to plant and equipment.

Future payments representing the principal amount for existing long-term leases for plant and equipment, extending up to twelve years, approximated $66,000,000 at December 31, 1972. Approximately 70% of these future payments pertain to tonnage gas plants, which supply customers under long-term sales contracts providing for aggregate minimum revenues which more than cover the aggregate rentals under such leases.

Statement of Consolidated Income

AIRCO, INC. AND SUBSIDIARIES

For the years ended December 31, 1972 and 1971

A 4677

EX-177-2-21

	1972	1971
Net Sales	$430,005,000	$411,409,000
Other Income—Net	2,052,000	3,455,000
Total	432,057,000	414,864,000
Deductions		
Cost of Goods Sold	394,039,000	312,691,000
Selling, Administrative and Other Expenses	63,752,000	59,805,000
Interest Expense	9,578,000	10,707,000
Federal and Foreign Taxes on Income	9,359,000	13,413,000
Total	476,713,000	396,616,000
Income From Continuing Operations	17,944,000	18,248,000
Income From Discontinued Operations, Net of Income Taxes	77,000	815,000
Income Before Extraordinary Item	18,021,000	19,063,000
Extraordinary Item, Net of Income Taxes	(16,000,000)	—
Net Income	$ 2,021,000	$ 19,063,000
Earnings Per Share of Common Stock		
Income From Continuing Operations	$1.53	$1.57
Income From Discontinued Operations	.01	.07
Income Before Extraordinary Item	1.54	1.64
Extraordinary Item, Net of Income Taxes	(1.37)	—
Net Income	$ .17	$1.64
Fully Diluted Earnings Per Share*		
Income From Continuing Operations	$1.45	$1.49
Income From Discontinued Operations	.01	.06
Income Before Extraordinary Item	$1.46	$1.55

*The Extraordinary Item and Net Income amounts, which are anti-dilutive in 1972, have been omitted. Net income per share in 1971 is $1.55.

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Consolidated Balance Sheet

December 31, 1972 and 1971

A 4678

EX-17-2-22

ASSETS	1972	1971
CURRENT ASSETS		
Cash and Short-Term Securities, at cost	$ 11,342,000	$ 20,630,000
Notes and Accounts Receivable, less allowances for doubtful accounts—1972, $922,000; 1971, $703,000)	86,091,000	86,436,000
Inventories	155,113,000	123,554,000
Prepaid Expenses	3,033,000	3,033,000
Total Current Assets	255,579,000	234,653,000
PROPERTY, PLANT AND EQUIPMENT (at cost)		
Land	8,241,000	8,224,000
Buildings and Leasehold Improvements	104,152,000	108,631,000
Machinery and Equipment	387,324,000	398,123,000
Construction in Progress	24,991,000	18,339,000
Contract Rights to Production and Distribution	5,250,000	5,250,000
Total	510,258,000	538,620,000
Less Accumulated Allowances for Depreciation, Amortization and Obsolescence	203,053,000	223,433,000
Property, Plant and Equipment—Net	307,205,000	315,187,000
INVESTMENTS (principally at equity)	3,179,000	3,923,000
LONG-TERM RECEIVABLES	15,544,000	16,439,000
DEFERRED CHARGES	3,253,000	7,685,000
GOODWILL, PATENTS AND TRADEMARKS (net of amortization)	6,056,000	5,317,000
TOTAL	$587,466,000	$583,306,000

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

A 4679

EX-177-2-23

LIABILITIES AND STOCKHOLDERS' EQUITY	1972	1971
CURRENT LIABILITIES		
Accounts Payable	$ 43,555,000	$ 30,706,000
Bank Loans and Currently Maturing Long-Term Debt	22,700,000	4,112,000
Accruals	20,033,000	15,074,000
Federal and Foreign Taxes on Income	839,000	871,000
Total Current Liabilities	88,128,000	50,763,000
LONG-TERM DEBT		
Convertible Subordinated Debentures, 3⅞%, due 1977-87	31,758,000	31,762,000
Sinking Fund Debentures, 6½%, due 1987	2,367,000	2,469,000
Domestic Bank Notes, 6% Currently, due 1976-79	50,000,000	64,604,000
Foreign Bank Notes, 6⅜-6 1/16% Currently, due 1976-77	19,819,000	15,274,000
Promissory Notes, 4.85-7¾% Currently, due 1976-88	66,951,000	68,159,000
Other Debt (principally mortgages)	6,426,000	5,456,000
Total Long-Term Debt	177,325,000	187,724,000
OTHER LIABILITIES AND DEFERRED CREDITS		
Deferred Income Taxes	66,675,000	73,788,000
Miscellaneous	7,865,000	2,796,000
Total Other Liabilities and Deferred Credits	74,540,000	76,584,000
STOCKHOLDERS' EQUITY	232,409,000	268,235,000
TOTAL	$572,402,000	$583,306,000

Statement of Stockholders' Equity

For the years ended December 31, 1972 and 1971

A 4680

EX-17-
2-24

	Common Stock —$1 par value	Capital in Excess of Par Value	Retained Earnings	Treasury Stock —at cost	Total Stockholders' Equity
Balance at January 1, 1971	$11,570,000	$108,030,000	$137,030,000	$(611,000)	$256,032,000
Net Income			19,083,000		19,083,000
Stock Used For Employee Stock Purchase Plan (113,784 shares)	114,000	1,934,000			2,048,000
Stock Option Plans (1,600 shares)	2,000	26,000			28,000
Dividends on Common Stock ($.80 per share)			(9,236,000)		(9,236,000)
Balance at December 31, 1971	11,686,000	110,050,000	147,107,000	(611,000)	268,232,000
Net Income			2,021,000		2,021,000
Stock Used For Employee Stock Purchase Plan (113,632 shares)	83,000	935,000		331,000	1,699,000
Stock Option Plan (198 shares)		3,000			3,000
Purchase of a Company (35,292 shares)				806,000	806,000
Dividends on Common Stock ($.80 per share)			(9,395,000)		(9,395,000)
Purchased for Treasury (52,293 shares)				(920,000)	(920,000)
Balance at December 31, 1972	$11,769,000	$111,041,000	$139,733,000	$(195,000)	$262,439,000

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Statement of Changes in Consolidated Financial Position

For the years ended December 31, 1972 and 1971

CO, INC. AND SUBSIDIARIES

A 4681

EX-172-
2-25

Sources of Working Capital	1972	1971
From Operations		
Income Before Extraordinary Item	$ 13,021,000	$ 19,063,000
Charges Not Requiring Current Outlays of Working Capital		
Depreciation and Amortization	23,152,000	26,616,000
Deferred Income Taxes	7,627,000	10,798,000
Working Capital Provided from Operations, Exclusive of Extraordinary Item	63,800,000	56,477,000
Extraordinary Item, Net of Income Taxes	(16,000,000)	—
Charges (Credits) Not Involving Working Capital		
Reduction in Net Non-Current Assets Due to Discontinuance of Business	26,363,000	—
Deferred Income Taxes	(14,740,000)	—
Working Capital Used For Extraordinary Item	(4,377,000)	—
Total from Operations	49,423,000	56,477,000
Proceeds from Long-Term Debt	57,137,000	7,645,000
Sales of Stock to Officers and Employees	1,902,000	2,076,000
Total Sources of Working Capital	108,462,000	66,198,000
Uses of Working Capital		
Capital Expenditures for Property, Plant and Equipment	40,500,000	32,200,000
Dividends on Common Stock	9,396,000	9,286,000
Reduction in Long-Term Debt	67,536,000	10,418,000
All Other Uses—Net	1,055,000	(4,142,000)
Total Uses of Working Capital	118,487,000	47,762,000
(Decrease) Increase in Working Capital During Year	(10,025,000)	18,436,000
Working Capital at Beginning of Year	183,787,000	165,351,000
Working Capital at End of Year	$173,762,000	$183,787,000
Changes in Elements of Working Capital		
Increase (Decrease) in Current Assets		
Cash and Short-Term Securities	$ (3,933,000)	$ 5,939,000
Notes and Accounts Receivable	9,559,000	(8,701,000)
Inventories	21,559,000	18,259,000
Prepaid Expenses	(161,000)	573,000
Change in Current Assets	26,926,000	16,070,000
Increase (Decrease) in Current Liabilities		
Accounts Payable	17,849,000	4,248,000
Bank Loans and Currently Maturing Long-Term Debt	19,679,000	(2,890,000)
Accruals	5,809,000	(1,753,000)
Federal and Foreign Taxes on Income	27,000	(1,976,000)
Change in Current Liabilities	43,364,000	(2,366,000)
(Decrease) Increase in Working Capital During Year	$ (16,438,000)	$ 18,436,000

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Accountants' Opinion

A 4682

EX-17-
2-24

HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TWO BROADWAY
NEW YORK 10004

To the Stockholders of Airco, Inc.:

We have examined the consolidated balance sheets of Airco, Inc. and subsidiaries as of December 31, 1971 and 1972 and the related statements of income, stockholders' equity, and changes in financial position for the years then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned statements present fairly the financial position of the companies at December 31, 1971 and 1972 and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles consistently applied.

Haskins & Sells

February 28, 1973

...-Year Financial Summary

...s In Th... Except Per Share Data

...CO. INC. AND SUBSIDIARIES

A4683

EX-177-
2-27

	1972	1971**	1970	1969**	1968**
Sales and Earnings					
Net sales*	$432,295	411,409	405,634	403,537	352,230
Income before taxes*	$ 37,200	31,681	29,646	29,557	27,650
Income from continuing operations	$ 17,944	18,248	17,105	18,590	13,034
Income (loss) from discontinued operations	$ 77	315	(111)	1,736	1,439
Income before extraordinary items	$ [illegible]	19,063	16,994	20,326	19,483
Extraordinary items	$([illegible])	—	(10,500)	—	1,515
Net income	$ 9,081	19,063	6,494	20,326	20,973
Average number of common shares outstanding	11,751	11,645	11,432	11,303	11,103
Earnings per share of common stock from continuing operations*	$ 1.53	1.57	1.50	1.65	1.62
Dividends Paid					
Dividends per common share	$ .80	.80	.80	1.15	1.50
Dividends on common stock	$ 9,398	9,266	9,163	12,863	16,647
Financial Position					
Total assets (less applicable reserves)	$607,430	583,306	564,583	550,210	493,624
Working capital	$173,762	183,787	165,351	155,042	140,363
Gross property account	$510,253	533,620	522,232	545,222	523,181
Depreciation and amortization*	$ 24,730	23,260	22,159	21,133	20,444
Long-term debt	$177,325	187,724	190,497	179,328	150,339
Stockholders' Equity					
Amount	$262,409	268,235	255,747	256,222	244,573
Common stock outstanding—shares	11,735	11,668	11,504	11,348	11,036
Per share	$ 22.31	22.99	22.23	22.58	22.16

*Continuing operations. Earnings per share of common stock are before discontinued operations and extraordinary items.

**Financial and operating results of companies acquired in poolings of interests in 1971, 1969 and 1968 are included from periods of acquisition. Other years have not been restated since, in the aggregate, the results of these companies for all periods are not material in relation to the consolidated sales and operations of Arcu...

Directors

*GEORGE S. DILLON
Chairman of the Board and
Chief Executive Officer

*RICHARD V. GIORDANO
President and Chief Operating Officer

CHARLES S. MUNSON
Honorary Chairman of the Board

*ALBERT FAULCONER, JR.
Retired Chairman,
Section of Anesthesiology,
Mayo Clinic

*RICHARD G. FOLSOM
Retired President,
Rensselaer Polytechnic Institute

JOSEPH H. HUMBERSTONE
Group Vice President

**R. L. IRELAND, III
Partner, Brown Brothers Harriman & Co.

ROBERT H. LEGG
Chairman of the Board,
Uris Buildings Corporation

ROBERT E. McNAIR
Partner, McNair, Konduros, Corley,
Singletary & Dibble
Attorneys, Columbia, S.C.

*CROCKER NEVIN
Chairman of the Board,
Marine Midland Bank—New York

*JOHN S. SHAW, JR.
Chairman of the Board and President
Southern Natural Gas Company

DOUGLAS B. STEIMLE
Partner, Shearman & Sterling

*Executive Committee—1972
*Audit Committee—1972

Officers

CX177-2-28

GEORGE S. DILLON
Chairman of the Board and
Chief Executive Officer

RICHARD V. GIORDANO
President and Chief Operating Officer

JOSEPH H. HUMBERSTONE
Group Vice President

NORRIS B. McFARLANE
Group Vice President

DAVID J. CRAIG
Group Vice President

DAVID H. LYALL
Vice President

DOUGLAS M. MORE
Vice President—Law

DONALD REICH
Vice President—Finance

DONALD B. SUSSEWITZ
Controller

WALTER J. NABER, JR.
Treasurer

JOSEPH M. WALSH, JR.
Secretary

[illegible]

[illegible]

[illegible]

A 4686

CX 177-2-30

A 4687

CX-207-A

(10A)

October 3, 1963

Mr. L. E. Smith - BOC
Joint Managing Director
London W.6, England

Mr. J. A. Perkins

Enclosed is a report of the visit to Gardner Cryogenics Corporation on September 24th made by Al Muller and myself, together with one set of Gardner Cryogenics literature. I am including two extra copies of the report for your convenience.

JAP/P
Encs.

Copy report to Dr. Lindenblad.

CX-267-B

Report on Visit

GARDNER CRYOGENICS CORPORATION
2136 City Line Road
Bethlehem, Pennsylvania, U.S.A.

Date: September 24, 1968

By: J. A. Perham
A. Muller

Interviewed: William A. Gardner, President
A. John Gardner, Manager Cryogenic & Industrial Gas Products

We had learned through the press that The Carpenter Steel Company of Reading, Penn., were acquiring Gardner Cryogenics Corporation. Last week we learned the deal had fallen through. Al Muller arranged an interview via John Gardner with Bill Gardner, President.

We asked Bill Gardner for details of the Carpenter offer and he provided us with a Carpenter quarterly report dated March 31, 1968 - copy enclosed. Gardner Cryogenics would have received 100,000 convertible preferred shares in Carpenter - callable in 5 years at $120 per share - paying dividends of $200,000 in years one to three and $450,000 thereafter. The 100,000 preferred shares could be converted to 300,000 common if held beyond three years. The deal was worth $12,000,000.

Bill Gardner personally owns about 2/3 of Gardner Cryogenics. He would have continued to manage the business as a division of Carpenter and would have been the single largest shareholder. He knows the management of Carpenter well - they are compatible - furthermore, the top executive are getting on in years.

Bill Gardner is 38 years old. He has a B.S. degree in Chemical Engineering from Lehigh University. He is married three years and has one child. Formerly he worked for Air Products in Allentown adjacent to Bethlehem, Penn., on liquid hydrogen research. He left them and founded his business in 1961 because he had an idea for a helium refrigerator and liquefier. This led him to seek a source of helium and resulted in a 50/50 partnership in Alamo Chemical Company with Phillips Petroleum Company.

CX-207-C

Report on Visit to Gardner Cryogenics Corporation

He said the deal with Carpenter did not fail on price. In the Carpenter Report they refer to a new company, Titanium Technology Corporation, to be owned jointly by Carpenter and Electronic Specialty Company. This deal is not yet consummated. In the meantime a much larger company, International Controls, has gained control of Electronic Specialty. According to Bill Gardner, if this venture goes through it is evident that International Controls will be the surviving company. Instead of being a major shareholder of Carpenter and managing an important division of Carpenter, he would be submerged in the International Controls empire. Further, while he knows the Carpenter executive and their ages, International Controls is quite a different matter. He was only willing to sell 100% of his company if he saw a future for himself in which he could be of value and influence. While he would benefit very substantially financially, at his age he does not want to retire and vegetate no matter how much money is involved. He claims he terminated the proceedings with Carpenter.

The authorized equity of the company is 500,000 common shares, of which 400,000 are issued. Bill Gardner owns two thirds, and about 4% are available for employee stock options.

Present sales will be just under $10-million this year. About 95% of these sales are in the USA and 15% are sales to the US government agencies. He said the capital employed is about $5-million and they have bank borrowings at 1/2% over prime rate (currently 6 1/2 + 1/2 = 7%) of $3-million. They had a loss last year over $1-million, caused by lengthy start-up difficulties at the Alamo Chemical plant and the need to buy helium at higher prices from the US Bureau of Mines to meet commitments. Profit this year is expected to be $200,000. There is a $1-million loss carry forward for tax purposes. The company auditors are Haskins & Sells. The company has as yet no pension plan and no union other than Teamsters on their trucks. They have experienced no labour problems. There is no litigation pending other than a minor employment contract with a former employee in Belgium. They have no licenses or agreements from or to anyone. There are no patents - believing because of their size that secrecy is the best protection.

The Alamo Chemical plant has a capacity of 140-million cubic feet per year of pure helium. Phillips Petroleum plan to build another plant with a capacity of 300-million s.c.f. per year of helium which will all be available to Gardner Cryogenics. The cost of this new plant is said to be $15-million. Gardner claims he was offered a half interest, but that

+u - total cost - $30,000.

CX-207-0

Report on Visit to Gardner Cryogenics Corporation

it was just too much for his company to undertake. Instead, he feels his product deal with Phillips is better. The Alamo Chemical plant strips helium from natural gas. Other heavy hydrocarbons are also stripped and sold to Phillips. The " cleaned" natural gas is sold or returned to a natural gas distribution company. Any surplus helium above Gardner Cryogenic requirements is sold to the US government under the helium conservation plan. Bill Gardner claims, as a result, that his company has the cheapest production cost for helium in the USA.

To date, sales have been primarily helium and we believe them to be number two in the USA market in both liquid and gaseous helium. They also are developing a substantial export market and appear to be well advanced in liquid transportation overseas. They are now starting cryogenic hardware sales, e.g. refrigerators, superconducting magnets, helium dewars and research vessels, helium trailers and low-temperature systems. They are also offering low-temperature process equipment. Copies of their brochures are enclosed.

Personally, Bill Gardner left a very fine impression at this first meeting. He appears sincere, enthusiastic, hard-working, and his performance to date indicates imagination, intelligence and courage. In our opinion he is Gardner Cryogenics and his abilities must be included in any acquisition.

Bill Gardner showed a sincere interest and willingness to take these discussions further. He suggested the week of October 28th in London as he will be in Europe at that time. Obviously, this business as an acquisition cannot be evaluated on past earnings. It can be judged on the technical competence he has put together. However, its real value lies in its future and what BOC could do with the business - assuming Bill Gardner could see a real future for himself in the venture.

In discussing the future, Bill Gardner indicated that he expected his present business to grow substantially in the period immediately ahead. He mentioned a figure of $50-million as a sales goal by 1975 without being specific as to the breakdown of these sales for his principal product lines, i.e. helium, process equipment and deep low-temperature devices such as super-conducting magnets. When questioned as to the amount of additional capital which would have to be invested in order to achieve the sales goal indicated above, he said he would prefer to take this matter under advisement and would be prepared to quote a figure and schedule for this capital at a later time.

CX-207-E

Report on Visit to Gardner Cryogenics Corporation

In considering the general matter of the future of this business and the integration of this business into the total BOC picture, it becomes obvious that if steps were taken to add additional outside capability to the Gardner operation and simultaneously to make use of certain advanced technology already available in BOC in the Cryoproducts, Edwards High Vacuum and Murex groups, an additional growth can be anticipated using the Gardner business as the basic vehicle for obtaining this additional growth. On a conservative basis, an additional $15-million of sales could be expected beyond the projection provided by Gardner.

In order to accomplish this objective in a minimum of time, it is suggested that consideration be given to the acquisition of the following organizations, each of whom has already given indication that they would be willing to discuss potential acquisition/joint venture with BOC. These organizations are:

1. Cryomagnetics - this organization is presently engaged in the manufacture of super-conducting materials for use in super-conducting magnets.

2. Cryenco - this organization is one of the original US companies engaged in the development, design, production and sale of a line of products similar to that of BOC's Cryoproducts group.

3. Energy Beams Incorporated - this is a small organization that possesses the technological capability to provide electron beam devices for melting, vacuum pumping, recording, etc., for use inside vacuum systems - this organization already has relations with Edwards High Vacuum.

These companies, each bringing a high order of technical capability into the spectrum of activities presently encompassed by Gardner, would provide a broadened base for growth in the US market, with the expectation that the advanced technology so commercialized would be available for overseas

Report on Visit to Gardner Cryogenics Corporation

markets at an appropriate time. The metallurgical, cryogenic and vacuum technology within the BOC groups would provide additional reinforcement for the development of the US market, provided the R & D programs in the BOC organizations could be suitably adjusted to reflect the requirements of the US market rather than be limited to the UK and other overseas markets as is the case today.

When the total capability of a consolidated unit embracing Gardner and the organizations listed above is coupled with the already existing capabilities in the BOC groups, it is quite probable that the strength of such a combination would be sufficient to compete with any other organization of this type in the US.

At this point in time, no attempt has been made to analyse how best to structure a group effort of the type proposed. This will be possible only after a suitable study of objectives and their relationship to personnel, facilities and capital is made. The intent here is to simply indicate that, by combining additional capability with that already present in Gardner, it should be possible to create a business of significant size in the US which will be concerned with high technology products and services. This capability can then be used overseas at such time as requirements for these products and services appear in other market areas.

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October 1, 1968

CX-207-G

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Present Value of

The Carpenter Steel Corporation Offer

for

Gardner Cryogenics Corporation

(assuming interest at 7%)

1.	P.V. of $12,000,000 (12,000,000 x .7130)	5 years at 7%	$ 8,556,000
2.	P.V. of $200,000 (200,000 x .9346)	1 year at 7%	186,920
3.	P.V. of $200,000 (200,000 x .8734)	2 years at 7%	174,680
4.	P.V. of $200,000 (200,000 x .8163)	3 years at 7%	163,260
5.	P.V. of $450,000 (450,000 x .7629)	4 years at 7%	343,305
6.	P.V. of $450,000 (450,000 x .7130)	5 years at 7%	320,850
		TOTAL	$ 9,745,015

GARDNER CRYOGENICS CORPORATION
2136 CITY LINE ROAD · LEHIGH VALLEY IND. PARK
BETHLEHEM, PA. 18017 U.S.A. TEL. (215) 264-4523

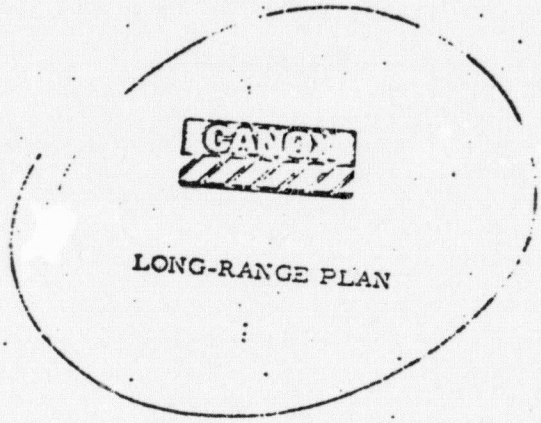
WILLIAM A. GARDNER
PRESIDENT

A 4694

CX-208-A

CONFIDENTIAL

(S)



LONG-RANGE PLAN

submitted

October 31, 1968

by

J. A. Perham

Copy No. 5.

For _____

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CANOX

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LONG-RANGE PLANNING

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CANOX

LONG-RANGE PLANNING

OBJECTIVES

1. Pre-tax and pre-interest return on capital to be achieved

   a) by 1969/70 - 15%

   b) by 1972/73 and thereafter - 17%

2. Average annual compound growth rate in sales turnover on 1967/68 performance in current dollars - 15%

3. By 1972/73 to reach a sales turnover of $30-million

4. To support the BOC group objectives

SUMMARY

If the acquisition of Liquid Carbonic Canadian Corporation becomes possible at any time during the five-year period of this plan, it will take priority. This long-range plan is what is envisaged if Liquid Carbonic is not available.

The $30-million sales by 1972/73 will be realized as follows: $22,500,000 will be CANOX sales, of which $17,000,000 is a projection of existing business, $3,915,000 the result of product/market expansion, and $1,585,000 will be minor acquisitions financed by CANOX.

The GAP of $7,500,000 will need to be filled by major acquisition, probably in the United States, and will require BOC financial support.

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LONG-RANGE PLANNING

STRENGTHS

current

Organizational

1. The company firmly believes in and practices delegation of authority and responsibility to the lowest level where a decision can intelligently be made.

2. Decentralization into regions encourages and develops managerial talents.

3. The company has written a creed, objectives, principles and basic policies; maintains current organization charts; has written position analysis for every management position with accompanying standards of performance. Appraisal interviews are stressed.

4. The company has been permitted by its parent full scope for decision-making with profit accountability.

5. Decisions at all levels are made with the minimum of delay.

Marketing - General

1. Sales decisions are encouraged at regional levels with a minimum of head office direction.

2. Receivables, collections and inventories are regional responsibilities.

3. Each region is a profit centre. Each region manager has an annually agreed profit target and a profit-sharing incentive.

4. All government tenders are centrally controlled.

5. Technical proficiency is adequate for the products we sell.

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LONG-RANGE PLANNING

STRENGTHS (cont'd)

Marketing - Industrial

1. Our welding and cutting equipment is second to none, e.g. Harris Calorific, Smith and Miller.

2. Our sales staff is well-qualified to serve medium to small customers when compared to competitors' distributor personnel.

3. The CANOX sales catalogue using the NWSA system is suited to distributor-type selling and is considered one of the best available.

4. Direct sales to the medium and small customer has been to date the competitive edge in developing our business.

5. Bilingual personnel are employed in all regions where French is predominant. This is not fully followed by our competitors.

6. There is a close liaison in marketing between sales, purchasing, stockkeeping and distribution.

7. A flexible sales approach to customers exists because region managers and their staff know product costs and desired gross profits. This is a major strength compared to our competitors.

8. Product managers, viz. gases, electric and industrial, provide technical and promotional support.

9. Our policy of converting large cylinder users to bulk is superior to our competitors. They consider bulk customers as house accounts, consequently their distributors are loath to reveal large cylinder accounts which could be better served by bulk. Where CANOX distributors exist they enjoy a continuing commission when conversion to bulk occurs.

CANOX

LONG-RANGE PLANNING

STRENGTHS (cont'd)

Marketing - Medical

1. Medical sales are a profit-centre division.
2. Boyle anaesthetic machine has an excellent reputation and today is copied by all competitors.
3. Principal competition in anaesthetic sundries is mainly from the many surgical supply houses with declining competition from our major gas competitors.

Personnel

1. Promotion from within the organization is given first consideration.
2. The company encourages the development of its people through recognized training courses.
3. Willingness exists to accept decision-making risks. This is considered a major strength versus our competitors.
4. The company appears to be well-balanced in experience and youth.

Public Relations

1. The new house style, particularly as evident on vehicles, is having excellent customer recognition.
2. The name CANOX is fortuitous.
3. Company advertising is credited with increasing customer acceptance.

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LONG-RANGE PLANNING

STRENGTHS (cont'd)

Production

1. Toronto plant is well designed and layed out.
2. Safety and maintenance is scrupulously followed. Not all competitors' plants equal our requirements.
3. Production personnel and especially liquid vehicle drivers are conscientious and well-trained.
4. Our production personnel are sales oriented.

Financial

1. Financial statistics are current and meaningful.
2. Our control of assets is considered superior to the competition.
3. Cost information is provided to all levels where it has useful application.
4. Our ability to borrow and repay has been carefully cultivated.

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LONG-RANGE PLANNING

STRENGTHS

potential

1. Capacity to learn and operate larger plants.

2. Ability exists to acquire large volume gas sales. Up to and including tonnage volumes, we are able to secure invitations to bid.

3. Sales capacity to handle new product lines, e.g. hydrogen, gases mixtures, CO_2, metallizing, liquid helium, rare gases, cryoproducts, welding machine rentals, surgical supplies, medical electronic monitoring equipment.

4. Potential exists to expand into new markets, e.g. respiratory therapy (Bird), aerosols, food (sparging, freezing), cattle (bull semen, freeze branding).

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LONG-RANGE PLANNING

LIMITATIONS

current

Organization

1. Some evidence that delegation of authority in some regions is not down to branch level.

2. Appraisal interviews require improvement.

3. The development of BOC products is distant for the Canadian markets. While communications on technical matters are encouraged, distance engenders non-comprehension of market requirements.

Marketing

1. Due to past successful development with distributor-type competition, a weakness is felt in the large account area.

2. Due to past development of our medical division with successful penetration of the anaesthetic field, promotional activities to hospital administration and other areas of hospital requirements need strengthening.

3. Many industrial products sold throughout the BOC organization are based on US licenses which exclude Canada, e.g.

Submerged arc	Pulsed arc
Micro plasma	Powder cutting
Polar stream	Cryo Quick (Quik)

4. Product line deficiency exists other than that caused by licensing problems, e.g.

Cryo products
Complete line of core wires
Portable straight line and medium size profile cutting machines
Competitively priced gas drive welding machine
Hospital pipeline and secondary equipment
Respirators
Oxygen therapy equipment

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LONG-RANGE PLANNING

LIMITATIONS (cont'd)

5. The above two classes of product deficiency weaken our customer relationship and restrict growth.

6. BOC products suitable for sale in Europe and other parts of the world are not readily suitable in Canada due to various national standards, e.g.

Thread sizes	CSA approvals
Pressure vessel regulations	(ASME/ASA)
Valve standards	AWS codes
N.F.P.A.	Mil. Specs.
Pipe standards	

These factors limit the availability to us of BOC standard products.

7. The vision, creativity and experience of product managers require developing.

8. Our technical literature is not as comprehensive as our competitors', e.g.

Electrode handbook Process literature

There is a growing need for literature in the French language.

9. There is a suspicion that we may not be making adequate use of the BOC film library.

10. The company is too welding supply oriented. There is a need to explore other uses for our products.

11. It is recognized it is no longer possible to build medical volume and growth with anaesthetic equipment.

12. There is insufficient support of medical sales at the region and branch levels in the cultivation of hospital personnel.

13. Industrial N_2O business has not been developed.

14. Insufficient emphasis has been placed on market research.

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LONG-RANGE PLANNING

LIMITATIONS (cont'd)

15. Reciprocal business is available to our competitors due to their diversification or size.

16. Certain medical sundries currently require to be purchased through BOC. They should be purchased direct from the supplier, e.g. face masks and other rubber goods.

Personnel

1. Because of company size to date, certain desirable specialist functions are not available.

Production

1. Lack of tonnage production places our gas products at a cost disadvantage which principally affects the following sales:

   Argon Nitrogen Large volume O_2 users.

2. The company is a single-plant operation for liquid.

3. The dependance on carbide to water generation of acetylene is presenting increasing sludge disposal difficulties.

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LONG-RANGE PLANNING

LIMITATIONS

within CANOX control

Organization - 1. and 2.

Delegation to branch level is being pursued as branch personnel capabilities are developed. Appraisal interviews seem to require a little more formalizing. This will be corrected at our next Annual Region Managers' Conference.

Marketing - 1.

The position of product manager - gases is vacant. We are looking for a competent man who would concentrate on large accounts.

Marketing - 2. and 12.

Our region managers must take a more active part in cultivating hospital contracts. Failure to do so to date has been excused by pressure of other work. This will be a subject for action at our next conference.

Marketing - 7.

The position of product manager was only created one year ago. We are still feeling our way.

Marketing - 8.

It is true that our technical literature suffers in comparison to Linde (U. C. C.). This weakness is in direct relation to our size and will be improved as we grow.

Production - 3.

Increasing sludge disposal difficulties may force us to dry generation. This is perhaps our most worrisome and time-consuming problem.

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LONG-RANGE PLANNING

LIMITATIONS

beyond CANOX control

Organization - 3.

We have had some influence in the development of BOC products - for example, Saffire and Boyle Model L & K machines. No doubt in the future we will have some influence on other products. While we must share some responsibility, broadly speaking this is a BOC problem as the manufacturer.

Marketing - 3.

The exclusion of Canada in virtually all USA licensing agreements to date is a serious handicap over which we have no control. This problem is appreciated by BOC but often has to be accepted as a commercial fact of life. We hope that future agreements will include Canada, at least on a non-exclusive basis.

Marketing - 6.

Canadian standards are beyond our control. ASME/ASA and pipe standards only affect plant and, while a nuisance, can be resolved. Cylinder valves must be to the CGA standard. Thread size is a question of production quantity. AWS codes virtually rule out foreign electrodes. The most serious problem is CSA approval for electrics. Some manufacturers, e.g. American, Japanese and German elect to meet CSA requirements for their entire production. This could be the solution for BOC cutting machines.

Marketing - 15.

Reciprocal business is a question of size and diversification.

Marketing - 16.

This is a rather gray area. We are directed by BOC Export Department to order rubber goods through them. We recommend direct purchases for faster delivery and probably better prices.

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CANOX

LONG-RANGE PLANNING

LIMITATIONS - beyond CANOX control (cont'd)

Production - 1.

This is our most serious weakness and will get progressively worse. We must obtain a tonnage supply scheme if we are to have economic merchant oxygen, nitrogen and argon. It is up to CANOX to develop every possibility for a tonnage supply scheme. This is largely a question of opportunity, followed by BOC/Airco ability to supply and the competitive situation.

Production - 2.

The problem of a single plant operation, unless we acquire a supply scheme, is likely to continue because to remain competitive we will be forced to a larger unit in Toronto rather than a second 600M^3/hr plant, say, in Montreal.

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY

The following figures are our best estimates of the Canadian welding market in 1967.

Canadian Welding Sales

Gases	$ 42-million
Industrial equipment & rods	10- "
Electrical equipment & electrodes	35- "
Other products	4- "
Total industry sales	91- "

Market Share by Companies

L' Air Liquide	40%
Linde (UCC)	22
CANOX	11
Liquid Carbonic	9
Others, e.g. Airco, Lincoln, etc.	18

CANOX Sales by Markets

	% Sales Dollar	*Profit/Market Index
Construction	25	B
Metal fabricating	20	E
Manufacturing	15	E
Transport & associated services	10	F
Shipbuilding	10	E
Scrap metal	5	I
Iron & steel	5	F
Medical - oxygen therapy equipment	)	F
anaesthetic equipment	) 10	A
gases	)	F

* Index as suggested RCH-J/RJF/SDG 16.7.68

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY (cont'd)

CANOX Market Share by Products

	Total Market $000	CANOX Sales $000	% Total Market
Oxygen	19,000	2,108	11.1
Acetylene	14,000	1,335	9.3
Argon/helium	8,000	274	3.4
CO_2	unknown	95	negligible
Nitrogen	unknown	92	negligible
Total gases			10
Gas equipment	7,000	1,341	19.0
Gas rods & fluxes	1,800	449	24.0
*Total industrial equipment & rods			15.5
Arc welding machines & accessories	14,380	1,206	8.3
Electrodes	20,300	1,515	7.4
Total electrical equipment & electrodes			8
Total CANOX share			11

* Industrial Equipment & Rods also includes safety equipment and some welding sundries.

Markets - Future Sales Potential

Construction

Many large construction companies prefer one supplier to supply their various job sites. Our direct sales policy gives us a decided advantage over local distributors representing our competitors. As we open new branches and become still more "national" in coverage, our market share should increase.

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY (cont'd)

Metal Fabricating

We have our fair share. Any further penetration would likely result in price deterioration.

Manufacturing

Our market share is small because of low nitrogen sales and no liquid argon product. This is a problem of plant size and production costs. Nitrogen and argon are the two fastest-growing products and offer our greatest market potential.

Transport

We have no business with the automobile industry because of very low prices and our relatively high cost of gases.

Shipbuilding

This is a dying market because of the removal of government subsidies.

Scrap Metal

Very low selling prices and inadequate gross profits. We do not pursue this market, but try to leave it to our competitors. The business we have is generally associated with other important customers. No relief is anticipated. This is a reducing market because of mechanical shears and declining use of scrap for primary steel production.

Iron & Steel

This is a captive market for tonnage plants. In order to compete in the merchant market we must get a tonnage plant whether tied to steel or to chemicals.

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY (cont'd)

Medical

Oxygen Therapy Equipment
We only have a minor share of this market due to our inadequate product line. This we will correct as suitable products become available.

Anaesthetic Equipment
We hold the dominant market share, and expect some decline due to competition and longer product life. Problem will be profit versus volume.

Gases
Good growth potential as our market share is inadequate and market is growing rapidly. Manufacturing agreement with Puritan-Bennett will decrease our costs substantially. Increased profit margin will permit us to aggressively seek new business.

Product Life Cycle

Gases

Oxygen
Total oxygen sales in USA were 820-million dollars in 1965, 851-million dollars in 1966, and 878-million dollars in 1967 - an average growth of 3.5% per annum.

Oxygen for welding sales over the same period were 190-, 193-, and 190-millions of dollars - or almost stagnant.

From observation we note that there has been no significant oxygen process development in welding/cutting in recent years, in fact the use of oxygen is being challenged by processes like plasma cutting and plasma spraying. In spite of the increasing use of fuels other than acetylene, which require from 2 to 4 times the volume of oxygen for combustion, consumption of O_2 remains static, much below the growth of the welding/cutting industry where

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY (cont'd)

average annual increase is 5%.

We must conclude, therefore, that the product "life cycle" of oxygen in our existing market has levelled off and could decline - whereas oxygen use in other fields exhibits strong, steady growth.

Acetylene

As with oxygen, acetylene is used in large volume outside the welding/cutting industry, but we note that total sales in USA slumped from a peak of 478- to 402-million dollars 1966 to 1967. Current sales are only slightly higher than 1963. In welding, sales fell off from 155- to 143-million dollars 1966 to 1967.

Alternative chemical technolog, d increasing cost of calcium carbide are primary causes for the decrease, but we cannot ignore such similar detrimental factors as the continuing decrease of gas welding, the use of other fuels for cutting and heating, the higher gas efficiency of modern cutting machines, competition from plasma cutting, and the expense and problems of sludge disposal.

Altogether, unless there are unforeseen technological developments in the manufacture and/or distribution of acetylene in the future, we can expect the current trend to continue and the life cycle of this product to be in decline.

Argon

Argon is used in many industries but it is estimated that 75% of current production is for welding. Annual average growth rate is 27.5% over the last 9 years, but average price is about 5 cents per cubic foot (US).

Life cycle of argon is excellent with still many years of vigorous growth ahead, but economics of production require large-scale manufacturing plants and "tonnage" demand for other atmospheric gases.

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PRODUCT/MARKET SURVEY (cont'd)

Nitrogen

Use of nitrogen in "welding" is very small, but consumption in other industries is huge and the potential even greater. The only limiting factor being cost.

The life cycle of nitrogen is in its phase of greatest growth, and it is logical that CANOX should participate in the expansion of an atmospheric gas product.

To do so on the scale necessary to offer a competitive challenge requires careful study of:

1. available technological expertise
2. plant size and type
3. storage and transportation costs
4. the effect of "seasonal" demand in some industries

Gas Equipment and Accessories

Total sales of gas equipment and accessories in 1967 were 6.5% to 7% below 1966, but still 6% over 1965 figures. This is parallel to the capital and repair expenditures of construction and metal fabricating industries with whom we do 50 to 70 per cent of our business.

In terms of Canadian business, we enjoy a greater share of gas apparatus than any other product, but it would be unrealistic to plan large expansion in a total market of 7-million dollars per year.

We also note that the average annual growth rate of gas apparatus (6.5%) is below that of the using industries, indicating a "loss of application" to other manufacturing methods. This is in spite of "new markets" for pressure regulators in M.I.G. and T.I.G. welding.

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LONG-RANGE PLANNING

PRODUCT/MARKET SURVEY (cont'd)

Electric Welding Machines and Accessories

From 1958 to 1966 arc welding machines and accessories rose over 300% in sales dollars - 1967 was off 7.7% from 1966, but still up 10% over 1965.

This is attributed to several factors:

1. improvement in performance per dollar cost of a. c. machines coupled with "iron powder" -type electrodes
2. more efficient and reliable static rectifiers
3. expansion of M. I. G. welding utilising a variety of constant voltage-type machines
4. exploitation of farmer-garage-hobby shop market with small, low-priced, limited input a. c. machines
5. boom in equipment rental business

It is difficult to see how this phenomenal growth rate can continue. It is estimated that over 10,000 welding machines were sold in Canada in 1966, and statistics show the "life" of a welder to average 12 - 14 years.

It is felt that the peak of arc welding machine growth has been reached, and while expansion will continue in M. I. G. equipment and in power sources for electron beam and plasma processes, it will be at the expense of conventional "stick electrode" machines which might well be at the point of saturation.

Electrodes

Total electrode production in the USA fell off 13.7% 1966 - 1967. Part of this drop was due to a general decrease in welding sales (off 5.5%) and part to a pronounced shift from "stick" electrodes to continuous wire.

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PRODUCT/MARKET SURVEY (cont'd)

Continuous wire processed (solid and cored wires) have a deposition efficiency of 90 to 98% compared with 75 to 80% for stick electrodes. This permits more deposited weld metal from less electrode. So, as this change from stick electrode to continuous wire progresses, there will be a corresponding reduction in the gross weight of electrode required.

Life cycle of stick electrodes is on the wane, and a boom period of continuous wires (particularly cored wire) has begun.

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LONG-RANGE PLANNING

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MARKET CHANGES

next 5 to 10 years

The following market changes are predicted:

Five years

1. Merchant suppliers will need a tonnage source of gas to remain competitive or else be relegated to distributor status.
2. Greatest growth will be in nitrogen, followed by argon.
3. Semi-automatic welding will largely displace stick electrodes.
4. Liquid helium will be an important market.
5. Product exchange from tonnage facilities between competitors will be common practice.
6. The Department of Weights & Measures will introduce controls on cryogenic liquids.
7. Oxygen will be used to increase sewage disposal efficiency.
8. Cyclopropane will be extinct.
9. Increasing use of disposables in hospital equipment will encompass sterile gloves, gowns, bed linen, mattresses, plus all patient sundries.
10. Small rural hospitals will decline with a concentration into large urban units. This will lead to centralized or government purchasing.
11. Educational purchasing will be centralized.

Ten years

1. Oxygen consumption in welding and cutting applications will seriously decrease due to plasma, laser and mechanical cutting.

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LONG-RANGE PLANNING

MARKET CHANGES (cont'd)

2. Acetylene is in old age in its life cycle and will be replaced by liquid hydrocarbon fuels unless it can be successfully handled as a liquid.

3. Plastics will replace metals for many uses. Industrial adhesives will become a welding medium. Deloro Stellite are presently "gluing" wear bars to the bed of Euclid trucks.

4. Oxygen will be used in garbage disposal, and a use will be found in atmospheric and/or water pollution.

5. Gaseous anaesthesia will be in decline.

6. Respiratory clinics will be popular.

7. Large customers will own their own cryogenic converters and will purchase liquid on an annual or even a spot basis.

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LONG-RANGE PLANNING

EXPANSION POSSIBILITIES

The following possibilities exist to expand our products and services. No effort is made to classify by priority or feasibility.

1. Sparklet products
2. Oxygen as an inhalent at health clubs, beauty parlours.
3. Respiratory clinics
4. Bulk deliveries to 5 - 10,000 c.f. per month
5. Abrasives for welding, e.g. depressed centre wheels, sanding discs, plus grinders and sanders
6. Welding machine rentals
7. Design service for industrial and hospital piping - installation also a possibility
8. Ethylene oxide fumigation and sterilization
9. Hydrogen production
10. Carbon dioxide
11. Liquid carbon monoxide
12. Scuba diving equipment
13. Helium filling of toy balloons using a sparklet bulb
14. Beer-on-tap for home consumption
15. Soft drink syrup plus sparklets
16. Propane salamenders, also infra red heaters

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LONG-RANGE PLANNING

EXPANSION POSSIBILITIES (cont'd)

17. Magnesium flares production
18. Manufacture of flux-coated bronze
19. Industrial adhesives
20. Food - packaging, sparging, freezing
21. Tobacco curing
22. Oxygen and nitrogen for aircraft and airports
23. Liquid nitrogen for surgery
24. Aerosols as a gas user, but also the possibility of an aerosol factory to do custom work.

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LONG-RANGE PLANNING

EXPANSION ACTION

current

Respiratory Equipment

An agreement has been reached with Dr. Bird for exclusive sales in Canada except Quebec, Alberta and British Columbia. We expect to field a fully-trained sales force by January 1969. Contacts are being established with the two Bird distributors with a view to acquisition within the next two years.

Helium

Transfilling equipment now being installed in building on our Toronto site. Plant should be operative before December 1968. Cost reduction in excess of 10% should increase sales possibilities. The availability of bulk deliveries of helium to our site makes liquefaction feasible. Market study for liquid is being reviewed.

Plastic Compounds

Automotive plastic body fillers are rapidly displacing soft solder. Feasibility study now underway.

Nitrogen

No major break-through can be expected until we get merchant nitrogen from a tonnage source. However, we have in our employ a food specialist from November 1, 1968, and expect increased sales in sparging, purging and blanketing.

Propellants

No action to date -- awaiting cheaper nitrous oxide. Industrial sales of N_2O should increase when product available from Puritan-Bennett.

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CANOX

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LONG-RANGE PLANNING

EXPANSION ACTION - current (cont'd)

Sundry Gases

These gases are principally argon. Discussions have started with Burdett Oxygen to buy liquid argon from their new Buffalo plant due on stream January 1969.

Patented Products

There may be a possibility that Airco will at last agree to license us to sell Pulsed Arc. We have been approached by Air Products to sell their Pulsed Arc and Microplasma. Because of our prominent position in cutting machines we must have plasma cutting available to us.

Cryoproducts

We believe a good market exists. We have made one market survey and merely await a suitable product.

New Region

Winnipeg, Manitoba, is our next logical place to expand. No action foreseen for at least one more year.

Hospital Pipeline Equipment

We are developing certain expertise and a reputation with NCG outlets, but cost is prohibitive. No adequate alternative as yet available.

Distributors

We expect to "acquire" (but not purchase) one competitor's distributor this year. Discussions are underway.

Other Acquisitions

All other acquisitions are speculative only and are at least one year away in priority.

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CANOX

LONG-RANGE PLANNING

ACQUISITION POSSIBILITIES

The following possibilities are foreseen not necessarily in order of merit.

1. Deloro Stellite
2. Electrode production, e.g. Airco Canada, MacKay/Harfac, Rockwe...
3. Soft solder, e.g. Canada Metal Ltd.
4. Safety supply, e.g. Fibre Metal, Simcoe Mit & Clove
5. Industrial Adhesives
6. Medical electronics
7. High purity research chemicals and metals
8. Surgical supplies, e.g. J. Stevens & Sons
9. Gas apparatus manufacture
10. Carbon dioxide, e.g. Liquid Carbonic, Airco Canada
11. Mechanical refrigeration to compliment LN refrigeration
12. Propane, e.g. partnership with B-A in Superior Propane
13. Liquefied natural gas distribution
14. Miller Electric
15. Equipment repair, e.g. Carter-Thompson or Welding & Supplies Ltd.
16. National Oxygen
17. Our own distributors, e.g. Red-D-Arc, Aurora Tank

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CANOX

LONG-RANGE PLANNING

ACQUISITION POSSIBILITIES (cont'd)

18. Competitors' distributors, e.g. Ottawa Valley Oxygen (CLA
Inter City Welding (Linc
Canadian Welding Gases (Linde

19. The old Cameron business which covers solvents and laboratory chemicals

20. Hospital furniture and accessories

21. A tonnage using industry as a partner, e.g. LASCO or Brockville Chemicals

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CANOX

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LONG-RANGE PLANNING

ACQUISITION SHOPPING LIST

* currently being considered - see accompanying notes

*1. Liquid Carbonic Canadian Corporation
- with or without LCC interests in South America

*2. Gardner Cryogenics

*3. Deloro Smelting & Refining

4. Airco Canada - including Ohio Chemical Division

5. Hobart Brothers, Inc.

6. Miller Electric Manufacturing Co.

7. Fibre Metal

8. Simcoe Mitt & Glove

9. Cameron Enterprises

10. Industrial Adhesives Limited

11. J. Stevens & Sons -

12. Carter Thompson

13. National Oxygen

*14. Red-D-Arc

15. Ottawa Valley Oxygen

16. Superior Propane - subsidiary of BA

17. Meal Master System Limited

18. Brockville Chemicals

19. Metals Joining Corporation - Inglewood, California

20. Weld Air Products, Inc. - Detroit, Michigan

21. Aerosols, Inc.

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CF-68-2-6

LONG-RANGE PLANNING

ACQUISITION PROSPECTS

under consideration

Liquid Carbonic Canadian Corporation

Liquid Carbonic Corporation are in the process of being acquired by Houston Natural Gas. It is possible that HNG can be persuaded to sell the Canadian part. If so, the acquisition would provide CANOX with distribution in every province, would put us into CO_2 and hydrogen, and we would inherit an electrode plant reportedly modern and producing the full range of electrodes for manual and automatic processes.

Net sales in 1966 were $13,608,000, and today are believed to be about $15-million. Net income is not likely more than 5%. We have calculated with probable savings through merging the two companies a ROC before tax of 13.7%.

This possible acquisition should be our prime target if and when available.

Gardner Cryogenics

The acquisition of Gardner Cryogenics is envisaged as a vehicle for BOC to enter the American market in the growing technical field of cryogenics. Gardner claims to be the second-largest domestic supplier of helium in the US and would thus be an additional future source for BOC. This company is rather well-advanced in liquid helium transportation, and also in specialized cryogenic vessels for research. Besides being a base for US operations, product knowledge and research and development would strengthen our cryoproducts division.

The synergy for CANOX would be in liquid helium vessels and in improved cryoproducts which we see as a developing market.

Deloro Smelting & Refining

Synergy is not primarily with CANOX but with BOC as an international organization and, in particular, with Murex's

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ACQUISITION PROSPECTS - under consideration (cont'd)

tungsten carbide and refractory divisions. Envisaged is the development of a wear-resistant/corrosion-resistant service to industry. Murex has tungsten carbide dies and inserts for wear, and tantallum sheets for corrosion. Deloro has stellite.

Deloro is not primarily in hard surfacing rods. Rods only represent 15% of their Canadian production. Since 1960 they have been building a wear- and corrosion-resistant service. From rebuilding of parts to original manufacturing drawings, they are now moving into CEM parts.

Stellite is complimentary rather than competitive to tungsten carbide. Just as important, the Deloro engineering approach to sales rather than product cost would probably add considerably to Murex.

CANOX would provide some synergy in administration and, no doubt, Deloro would broaden CANOX market for existing CANOX products.

Red-D-Arc Welding Supplies Limited

Wholly-owned by Pres Featherstone, who states he is prepared to sell the welding supply section of his business and retain his interest in welding machine rentals. Preliminary discussions have been held. Their past five-year financial statements have been promised.

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CANOX

CX-208-2-8

LONG-RANGE PLANNING

ACQUISITION PROSPECTS

of special interest

Air Reduction Canada Limited

This company now includes Ohio Chemical Canada Limited as a division. This medical division accounts for 50% of the nitrous oxide sold in Canada. We believe their equipment sales to be small and, due to the price war on nitrous, their profit is probably marginal. Airco probably manufacture a third of the electrodes used in Canada. They have about 15% of the CO_2 market and probably 25% of the helium market. If Airco could be induced to withdraw from Canada, we could be quite interested.

Hobart Brothers, Inc.

There have been rumours in the past that this business is acquirable. Credit reports rate their net worth at $50-million. They are well-regarded in the electric welding market and are considered to be well-diversified.

Miller Electric Manufacturing Co.

As with Hobart, there have been rumours that this business could be acquired. Credit reports place an estimate of $8-million on net worth. While not as broad in product range as Hobart, we consider their welding transformers the best available anywhere.

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CANOX

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LONG-RANGE PLANNING

ACQUISITION ACTION

immediate and future

Immediate

1. Liquid Carbonic Canadian Corporation
2. Gardner Cryogenics
3. Deloro Smelting & Refining
4. Air Reduction Canada Limited
5. Red-D-Arc

Future

1. Hobart Brothers, Inc.
2. Miller Electric Manufacturing Co.
3. Brockville Chemicals Limited
4. J. Stevens & Sons
5. Superior Propane
6. Cameron Enterprises
7. Ottawa Valley Oxygen
8. Meal Master Systems Limited

We place top priority on Liquid Carbonic. Any prospect on the shopping list could become an immediate candidate, otherwise the above list is roughly according to priority.

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CANOX

C# 208-10

LONG-RANGE PLANNING

National Industrial Conference Board
Chartbook of
Current Business Trends
in Canada
(1968 Edition)

1. Gross National Product

	1963	1964	1965	1966	1967
Millions of current $'s	43,424	47,393	52,203	58,120	62,068
% change previous year	7.0	9.1	10.1	11.3	6.8
Five-year average %			8.9		
Millions of constant 1957 $'s	39,352	41,876	44,768	47,670	49,007
% change previous year	5.1	6.4	6.9	6.5	2.8
Five-year average %			5.5		
Inflation content %	1.9	2.7	3.2	4.8	4.0
Five-year average %			3.4		

2. Manufacturing Production

Index (1961=100)	118.0	129.2	141.0	151.2	151.7
% change previous year	6.8	9.5	9.1	7.2	0.3
Five-year average %			6.6		

Inflation

average rates

A. Increase in price level affecting CANOX trading for next 5 years assumed to be 4.0% which is the average for last 3 years

B. Expected increase in price level for next 5 years 4.0% based on the average for last 3 years

C. Average price increase last 5 years was 3.4%

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1/10/68

Date prepared: October 25, 1968

CANOX

LONG-RANGE PLANNING

PAST PERFORMANCE - 1961 to 1967 - R.O.C.E.

($000's omitted)

	September 30						
	1961	1962	1963	1964	1965	1966	1967
Cash	126	106	148	107	107	51	151
Accounts receivable	696	990	1,382	1,445	1,689	1,976	1,797
Inventories	750	1,007	1,560	1,482	1,706	1,770	1,649
Prepaid expenses etc.	59	79	63	94	81	97	132
Current assets	1,631	2,182	2,923	3,128	3,583	3,894	3,729
Accounts payable etc.	408	690	986	807	1,074	828	1,148
Net current assets	1,223	1,492	1,937	2,321	2,509	3,066	2,581
Mortgages & other assets	236	189	157	96	-	210	135
Fixed assets (net)	2,519	3,268	4,018	4,460	5,072	5,174	5,475
Capital employed	3,978	4,949	6,112	6,877	7,581	8,450	8,191
Average capital employed		4,264	5,531	6,495	7,229	8,016	8,321
Profit before interest paid and income taxes		162	455	529	666	1,168	958
Return on average capital employed		3.8	8.2	8.1	9.2	14.6	11.5

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CX-208-2-12

Date prepared: October 25, 1968

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SCHEDULE 1

LONG-RANGE PLANNING

SUMMARY
(figures to nearest $000)

	Actual 1966/67	Latest forecast 1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	Compound growth rate 1967/68 - 1972/73
SALES								
(A) OBJECTIVE	11,000	11,720	14,100	17,000	20,500	24,750	30,000	20.5
(B) PLAN	10,815	11,000	11,760	12,640	13,590	15,300	17,000	9.0
Basis - 1969/71 Estimates								
Adjustments and extension of Estimates:-								
i - Price changes and changes in price structures in money terms	-	-	-	-	-	-	-	-
ii - Expansion plans in existing and closely related products/market	-	-	635	1,326	2,347	3,291	3,915	-
iii - Acquisitions of new businesses in existing or closely related fields	-	-	-	755	1,155	1,478	1,585	-
iv - Allowance for inflation	-	-	-	-	-	-	-	
v - Other	-	-	-	-	-	-	-	
LONG-RANGE SALES PLAN (in money terms) (per Sch. 2)	10,815	11,000	12,395	14,721	17,092	20,069	22,500	15.0
The gap between plan and objective (A-B)	125	720	1,705	2,279	3,408	4,681	7,500	

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CANOX

CX-2-2-3

SCHEDULE

LONG-RANGE PLANNING

ESTIMATED ADDITIONAL GROSS REVENUE GENERATED

Schedule 1

(ii) Expansion and (iii) Acquisition

($000)

	1968/69		1969/70		1970/71		1971/72		1972/	
	EXP	ACQ	EXP	ACQ	EXP	ACQ	EXP	ACQ	EXP	
Helium - gas	65		71		78		86		100	
- liquid			50		100		200		300	
Nitrogen	20		50		100		150		200	
Propellants	30		50		100		150		200	
Sundry gases	10		25		50		75		100	
Patented products	10		30		50		75		100	
Cryoproducts			100		200		250		250	
New region			50		100		150		200	
Hospital pipeline			85		90		95		100	
Distributors A	250		265		279		295		310	
B					300		315		335	
C							200		220	
Plastic compounds	200		400		600		800		1000	
Respiratory equipment	50		150		300		450		500	
bird distributors A				150		155		163		
B						150		155		
Surgical supply house				425		450		475		
Industrial adhesives								235		
Food processing						200		225		
Aerosols				180		200		225		
Total	635		1326	755	2347	1155	3291	1478	3915	
Combined total	635		2081		3502		4769		5500	
Annual increase over previous year	635		1446		1421		1267		731	

October 25, 1968

Date prepared: October 25, 1968

CANOX

LONG-RANGE PLANNING

SCHEDULE 2

ANALYSIS BY PRODUCT GROUPS
(figures to nearest $000)

	Actual 1966/67		Latest forecast 1967/68		1968/69		1969/70		1970/71		1971/72		1972/73	
	Sales	Gross margin	Sales	Gross margin	Sales	Gross margin	Sales	Gross margin	Sales	Gross margin	Sales	Gross margin	Sales	Gross margin
Gases - Industrial	4,787	3,049	5,125	3,236	5,753	3,591	6,320	3,940	7,190	4,394	8,395	4,917	9,382	5,482
Medical	367	207	369	225	400	290	430	262	462	282	520	317	600	366
Other (handigas, etc.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonnage														
Equipment - Industrial A	2,300	810	2,285	787	2,485	860	2,685	928	2,937	1,007	3,344	1,100	3,782	1,242
Medical	638	273	649	278	740	313	1,555	530	1,945	662	2,238	766	2,435	836
Electric welding	2,723	692	2,572	644	2,817	709	3,051	774	3,358	849	3,837	941	4,301	1,063
Other (e.g. handigas)					200	96	680	282	1,200	440	1,735	709	2,000	849
Other activities														
Total Sales (per Sch. 1) and gross margins	10,815	5,031	11,000	5,170	12,395	5,659	14,721	6,716	17,092	7,634	20,069	8,750	22,500	9,838
Less: Overheads	4,074		4,314		4,867		5,530		6,228		6,548		7,068	
Profit before tax and interest	957		956		992		1,186		1,406		2,202		2,770	
Less: Interest	45		17		47		116		205		230		244	
Profit before tax	912		939		945		1,070		1,201		1,972		2,526	
Taxation	381		531		472		535		600		986		1,263	
LONG RANGE POST TAX PROFIT PLAN (in money terms)	531		308		473		535		601		986		1,263	
Dividend	37.8%		64.9%		66.6%		66.4%		66.6%		65.9%		66.5%	
BOC ordinary shareholding	37.8%		64.9%		66.6%		66.4%		66.6%		65.9%		66.5%	
Pre-tax and pre-interest return on average capital employed (Schedule 3)	11.2%		10.2%		11.2%		11.7%		11.9%		16.2%		18.4%	
					OBJECTIVE 15%						OBJECTIVE 17%			

A-4733

CR-208-2-14

12 R.O.C. virtually achieved
but growth about by $75.

Date prepared: October 25, 1968

SCHEDULE 3:

CANOX

LONG-RANGE PLANNING

A-4734

CAPITAL EMPLOYED SUMMARY
(figures to nearest $000)

	Actual 1966/67	Latest forecast 1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Basis - 1969/71 Estimates							
Fixed Assets (net)	5,610	5,351	5,876	6,240	7,341	7,916	8,296
Current Assets (net)	3,068	2,972	2,883	3,033	3,104	3,767	3,892
Trade Investments							
Estimated Capital Employed	8,678	8,323	8,759	9,273	10,445	11,683	12,188
Adjustment and extension of Estimates							
Additional fixed assets (net) required to support Sales Plan (Sch. 1)							
(a) by way of direct investment	-	-	496	596	848	1,029	1,109
(b) by way of acquisition of an existing business	-	-	-	607	847	1,048	1,048
Inflation adjustment on total additional capital expenditure (in so far as not allowed for above)	-	-	-	-	-	-	-
Additional current assets required to support Sales Plan per Sch. 1 (i.e. increased debtors etc.)	-	-	124	365	680	933	1,101
Other							
Additional trade investments (in money terms)	-	-	-	-	-	-	-
LONG-RANGE CAPITAL EMPLOYED PLAN (in money terms)	8,678	8,323	9,379	10,841	12,810	14,693	15,446
SUMMARY							
Fixed assets	5,610	5,351	6,372	7,443	9,026	9,993	10,454
Current assets	3,068	2,972	3,007	3,398	3,784	4,700	4,992
Trade investments							
	8,678	8,323	9,379	10,841	12,810	14,693	15,446
Represented by:-							
Estimated share capital etc.	6,496	6,496	6,496	6,496	6,496	6,496	6,496
Additional planned share issues	-	-	-	-	-	-	-
Retentions	667	775	933	1,113	1,314	1,650	2,173
Estimated borrowings	7,163	7,269	7,429	7,609	7,810	8,146	8,669
Additional planned borrowings - overdraft	450	-	1,103	2,342	-	911	674
- ex BOC	-	-	-	-	-	-	-
- local long-term loans	-	-	-	-	4,000	4,000	4,000
Taxation	664	654	472	535	600	986	1,103
Cylinder deposits	-	-	-	-	-	-	-
Dividends	201	200	315	355	400	650	810
LONG-RANGE CAPITAL EMPLOYED PLAN (in money terms)	8,678	8,323	9,379	10,841	12,810	14,693	15,446
Average capital employed		8,500	8,850	10,110	11,826	13,752	

A-4734

CF-68-4-15

Date prepared: October 25, 1968

CANOX

SCHEDULE 4

LONG-RANGE PLANNING

CASH STATEMENT
(figures to nearest $000)

	Actual 1966/67	Latest forecast 1967/68	1968/69	1969/70	1970/71	1971/72	1972/73
Cash inflow							
Pre tax post interest profits (Sch. 2)	912	839	945	1,073	1,201	1,972	2,526
Depreciation retained	553	569	643	748	901	1,114	1,273
Share issues for cash	-	-	-	-	-	-	-
Increase /decrease/ borrowings (local)	/650/	/450/	1,103	1,239	1,659	910	/237/
Total inflow	815	958	2,691	3,057	3,761	3,996	3,562
Cash outflow							
Capital expenditure - estimate	654	292	1,113	1,046	1,908	1,380	1,530
- adjustments	-	-	551	111	270	201	90
Long-range capital expenditure plan							
Acquisitions for cash	135	-	-	675	255	235	-
BOC loan /increase/repayment	-	-	-	-	-	-	-
Net increase /decrease/ in working capital	/274/	/151/	392	355	347	535	155
Taxation	-	514	472	535	600	986	1,263
Dividends	-	201	315	355	400	650	840
Total outflow	715	853	2,843	3,127	3,760	3,987	3,568
Net inflow/ /outflow/	100	105	/152/	/70/	1	9	/6/
Opening balances	51	151	256	104	34	35	44
Closing balances	151	256	104	34	35	44	38

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CS-208-2-1/6

A 4736

date 16th May, 1969

from R.C. Hesketh-Jones

our ref RCHJ/DMB CX-207.

to Mr. J.A. Perham,
CANOX.

your ref

Mr. W.E. Ford, of Gases Division, was in the States recently and met Mickey Loveman and W.H. Loveman. His visit was in connection with Plan 70, and he went to see Burdett to talk about rail car operations. As he was leaving they both asked him to convey their regards to the Chairman and others in BOC, and W.H. Loveman said "and tell them to remember that there are still some Burdett operations which may be for disposal if BOC is interested." Ford thinks, but is not quite sure, that they were referring to something in the north west. Does this ring any bell with you? Anyway, can I leave it to you to follow up if and how you think best?

By the way, I did not know of Ford's visit to the States, and nor, I expect, did you. This is one of the things we shall have to sort out in the communications arrangements to be announced.

R. Hesketh-Jones

R.C. Hesketh-Jones

A 4737

CA-210

MEMORANDUM OF TELEPHONE CONVERSATION WITH

Mr. Richard de La Chapelle - Senior Vice President
Dean Witter & Co. Incorporated

Mr. Kevin J. Bradley - "

June 9, 1969 - 10:30 a.m.

SUBJECT: Airco

Kevin Bradley had lunch with George Dillon, President of Air Reduction Company, Incorporated, on Thursday, June 5th. He asked Mr. Dillon specifically if Airco Industrial Gas business might be available for sale. He said 'yes' -- providing it was a price compelling to him. While he is not anxious to sell, he certainly will listen because he feels he can more profitably redeploy his assets. He said that the metals, carbon and graphite, and ferro-alloy divisions are not for sale.

To the best of Mr. Bradley's knowledge, no one else has had the imagination to believe that Airco might sell their basic business. Because of the close relationship of Dean Witter & Co. with Airco they are not in a position to advise us the price to offer. However, if we are interested it is suggested that we should make direct contact with George Dillon.

It is a fact that the cryogenics division -- the old Hofman Laboratories business -- is for sale. Airco are now negotiating with someone and, if we should be interested in this part of Airco's business, we had better move rather quickly.

In thanking Messrs. de La Chapelle and Bradley for their action on our behalf I told them I would let them know the BOC reaction to this information.

JAP/P
June 9/69

A 4738

CX-213-4

June 11, 1969

Mr. J. A. Perham
Toronto, Ontario, Canada

Meeting with Dean Witter & Co.
14 Wall Street, New York City

RESTRICTED

Mr. R. C. Hesketh-Jones
London, England

On May 27, 1969, Mr. R. W. Stevens and I visited Dean Witter & Co. in New York. The purpose was to ascertain the various methods used in acquisitions in the United States and the possibilities open to BOC.

Enclosed is a memorandum of this meeting prepared by Bob Stevens. Paragraph 15. sets out the two most likely prospects available to us, namely, a small privately-owned company being sold in settling an estate or else a division being spun-off by a large company requiring cash. In the United States a buyer with cash is at a distinct disadvantage against a conglomerate with a high P/E ratio, high gearing and an adequate source of "turn around" borrowings.

You will note the reference to Airco -- its industrial gas division and its cryogenic division. Both can be acquired as mentioned in my memo of June 9th. I am not too enthusiastic about either possibility, but I would really like to meet Mr. George Dillon and ask point blank what they might sell. Because of BOC relations with Airco, I think an introduction should be arranged via Leslie Smith or yourself if you know him. Obviously we cannot make the approach through Giordano or any of their other operating people.

On re-reading my memo of June 9th I see I forgot to say that Mr. Bradley did not mention BOC. He said he knew of a foreign company in a similar field who might be an interested purchaser if Airco had anything for sale.

The meeting with Dean Witter may prove useful if we need the help of investment bankers; it advertises our interest to people who also act as business brokers; and perhaps will help us to focus our efforts where we have the best chance of success.

JAP/P
Enc.

A 4739 CY-213-A

May 28, 1969.

MEMORANDUM of points that were discussed by Messrs. J. A. Perham and R. W. Stevens on behalf of The British Oxygen Company Limited (BOC) at a meeting in the offices of Dean Witter & Co. (Dean Witter), 14 Wall Street, New York, N.Y., on May 27, 1969, which was attended by the following representatives of Dean Witter:

Richard de La Chapelle	-	Senior Vice-President
Kevin J. Bradley	-	Senior Vice-President in charge of Research Dept. of Dean Witter
Edward R. Black	-	New Business Dept.
George Wiegers	-	New Business and Underwriting Depts.
Robert Ehrber	-	Corporate Finance Dept.

1. At the outset we reviewed the securities that could be used in a tax-free exchange under the Internal Revenue Code of the United States (the Code) and we were informed that voting stocks were the only ones that could be employed in such an exchange which would include convertible preferred with voting rights. Some comment was made in the use of debentures, and apparently the tax liability of an exchange of stock for debentures results in the deferment of the tax until the debenture is in fact paid. It is possible to mix debt and voting stock in an exchange offer, but Dean Witter was not clear as to the manner in which it could be apportioned. This matter will have to be pursued further but apparently as long as not more than 40% of the value of the securities being offered in the exchange is non-voting, the tax-free aspect of the exchange to the extent that it applies to the voting securities will not be placed in jeopardy. Dean Witter do not profess to be tax experts and accordingly RWS has undertaken to

pursue this matter with lawyers of his choice in New York.

2. There apparently is no distinction from a tax standpoint in the sale of shares and the sale of assets; however, if the vendor of assets has outstanding debt then a portion of the debt can be assigned to the assets being sold and assumed by the purchaser without precipitating any tax, provided the balance of the purchase price is paid with voting securities.

3. In dealing with the specific problem of BOC, consideration was given to the incorporation of a U.S. subsidiary for all of the BOC activities in the U.S. and then, having established a reasonable financial history, listing the shares of the Company on a U.S. stock exchange (preferably New York or the American Exchange) and using the shares of the subsidiary in the future acquisitions. Dean Witter gave as an example Plessey Incorporated which is a subsidiary of a large U.K. electric company, and Sogemines Limited, which is a Canadian subsidiary of a Belgian chemical corporation. At this point Mr. Black stated that in any large transaction it is essential to have an acceptable security to exchange and it would be ridiculous to think that a company with a total of $3,000,000 in assets (such as Plessey Incorporated) could use its voting securities to purchase $100,000,000 of Airco assets, as an example. He also questioned if BOC shares would be acceptable in a tax-free exchange (a) from a purely tax standpoint in light of the fact that BOC is a foreign corporation, and (b) because it is a foreign corporation not listed on a U.S. stock exchange.

CX-213-D

4. As an alternative to the issuance of the securities of a BOC U.S. subsidiary, the representatives of Dean Witter were asked if a tax-free exchange could be arranged by incorporating the U.S. subsidiary, having BOC advance to it by way of capital investment or otherwise $50,000,000 which would be employed in the acquisition of highly acceptable U.S. stock such as General Motors, AT&T, etc., and then using these acceptable U.S. securities with full voting rights in the exchange for the assets or shares of the business which has been selected by BOC. Dean Witter stated that in their opinion this had never been done; they could not see why it should not be, but it would have to be reviewed from a tax standpoint. Assuming such an arrangement would be acceptable consideration might be given to the advantages and disadvantages of incorporating the holding company in a tax haven country in the first instance, thus protecting the holding company against any capital gains tax that might arise from an increase in the value of the GM stock between the time it was purchased and the time it was used in the exchange offer.

5. If consideration is given to the listing of BOC stock on a U.S. exchange, it is essential that a thorough review of the consequences of such listing be conducted beforehand, and particular reference was made to the registration requirements with the Securities Exchange Commission and the tax consequences resulting therefrom, if any. Mr. Black also commented on the price at which BOC shares were trading, namely approximately 13 shillings (US$2.60), and the price at which first line companies on a New

York stock exchange were traded, namely something in excess of $30.

6. Mr. Perham discussed at some length with Mr. Black the various product lines that he would be interested in and this would serve to facilitate the review of possible acquisitions by Dean Witter. In addition, Mr. Perham undertook to provide Mr. Bradley with ten copies of the BOC financial statements for use by the representatives of their research department, and also to provide Mr. Black with the names of all the members of the Compressed Gas Association. In considering available acquisitions, Mr. Black also mentioned that the representatives of BOC and Canox would have the best contacts in reviewing product fits and marketing techniques which are compatible with those of BOC.

7. Mr. Bradley is close to Airco and has undertaken to discuss with George Dillon, the President of Airco, what divisions of Airco are available and whether or not such divisions when sold would be sold for cash or on an exchange of securities. Specifically, reference was made to the Hoffman Cryogenic Division on the west coast and the Industrial Gas Division. In this discussion Mr. Bradley suggested that as the cryogenic division was reasonably small it would probably be sold for cash. He also suggested, however, that Dillon had stated publicly that Airco was considering acquisitions which presumably would be for cash in light of the depressed value of its stock, and therefore because of its debt structure it would be necessary for it to sell some substantial

EX-213-F

assets in order to obtain the cash to complete the acquisition. Apparently the only divisions that are not, in Bradley's opinion, available for sale are the chemical division and the metals division.

8. There was a fairly lengthy discussion of the state of the industrial gas business in the United States, with particular reference to the price wars that are continuing, which serves to mitigate against purchasing the industrial gas division of Airco, and no further comment is needed in this memorandum as Mr. Perham is thoroughly familiar with all of the ramifications of this point.

9. In comparing the acquisition of any Airco division with the sale by General Dynamics of its liquid carbonic operations, it must be appreciated that General Dynamics incorporated a new subsidiary for the purpose of transferring all of the U.S. assets of the liquid carbonic division to the subsidiary. This included the shares of the foreign gas operations, such as Liquid Carbonic of Canada Ltd. The shares of the new Liquid Carbonic subsidiary were then distributed to the shareholders of General Dynamics, thus necessitating Houston Natural Gas making the offer to the shareholders of General Dynamics rather than to General Dynamics itself. It is possible, and indeed probable, that Airco because of its substantial debt of $150,000,000 could not go through the same reorganization, particularly if it was desirous of obtaining additional funds for future acquisitions, because if it took the

General Dynamics precedent the consideration paid for the division that would be sold would go to the Airco shareholders rather than to Airco. In addition, it is probable that any sale of Airco assets (which are substantial) will require the approval of the Airco bondholders.

10. Mr. Perham emphasized that he was not interested in an acquisition of less than $1,000,000 and could not consider an acquisition that involved a direct payment by BOC of more than $50,000,000. It is possible that with $50,000,000 invested by BOC an additional $50,000,000 could be obtained through borrowings, thereby increasing the range to $100,000,000.

11. Mr. Perham also suggested that consideration of the desirable acquisitions should not only include companies in the same business and compatible product lines but also companies that were employing the same type of marketing procedures and calling on the same customers on a national level, and gave as an example the acquisition of the abrasives and grinding divisions of the Norton Company.

12. It was suggested by Dean Witter that Canox might be listed on the American Exchange with a view to financing it in such a way that the Canox securities could be used. Mr. Perham mentioned that consideration had been given to listing Canox securities on the Toronto Stock Exchange and that the Canadian fiscal agents of Canox (Wood Gundy) had recommended this step be deferred for approximately two years until the favourable profit increase experienced by Canox in the last two or three years could be

projected further on a five-year basis.

13. If Dean Witter locates a vendor and brings the transaction between the vendor and BOC to a conclusion, it is expected that Dean Witter will claim a finder's fee. The going rate in New York apparently is 5% of the first $1,000,000 of purchase price, 4% of the second, 3% of the third, 2% of the fourth, and 1% of the fifth, for a total of $150,000 of a $5,000,000 purchase. Any portion of the purchase price in excess of $5,000,000 would involve a negotiation of that portion of the finder's fee attributable to the consideration in excess of $5,000,000. It was suggested, and Dean Witter agreed, that if other services were being provided, such as Dean Witter acting as the underwriter in a stock issue or a debt placement which is a part of any acquisition, then the finder's fee might well be adjusted.

14. It was made clear that there was no commitment being given to Dean Witter at this time and indeed, when Mr. Black volunteered to obtain through their attorneys Sullivan & Cromwell certain tax opinions, he was informed that this would be unnecessary and RWS will examine into this aspect upon receipt of instructions from Mr. Perham. All future considerations relating to the manner in which an acquisition should be effected are really tax oriented, and therefore opinions on the outstanding points should be obtained reasonably soon.

15. It was inferred from the meeting that the best choice available for an acquisition was either a small privately owned

company where the shares might be purchased for cash because of peculiar family conditions, or a division of a large company which required cash, such as Airco. At this point Mr. Perham asked what the arrangements were when L'Air Liquide purchased American Cryogenics from Standard Oil of New Jersey. Mr. Bradley undertook to obtain particulars of this transaction as it may be of some help in our deliberations.

In closing, there was a reference to the fact that the cash offer of Burdett, BOC and AGA for the liquid carbonic division of General Dynamics of $88,000,000 was $6,000,000 in excess of the value of the Houston Natural Gas securities that were ultimately exchanged for the shares of the newly formed Liquid Carbonic subsidiary. In any exchange offer we must therefore consider the reputation in the U.S. of the securities that BOC, directly or indirectly, will be offering.

R. W. Stevens.

RWS:mn

cc: J. A. Perham, Esquire

A4747

date 20 June 1969

from Mr R.C. Hesketh-Jones

our ref RCHJ/SDG CX-214

to President
CANOX

your ref

Dear Cilian.

RESTRICTED

Thank you for your letter of June 11 about your visit to Dean Witter. I have spoken to Leslie Smith about your suggestion that you should meet Mr George Dillon of Airco and ask him point blank what they might sell. He does not think that any approach should be made to Dillon on this matter directly either by him or you. He takes fully the point that the existence of the conversations between you and Dean Witter about Airco should not be made known to anyone else in Airco and, in fact, he does not think there should be any hint at all to Dillon that we have talked to anybody else about Airco.

Giordano is going to be over here sometime in the next couple of weeks and he believes that he might be able to draw him out on Hoffman without in any way indicating that we have had any 'hint' about this which he feels is the only part of Airco we might conceivably be interested in, and even here he is rather doubtful.

Chris

(R.C. Hesketh-Jones)

CX-216

July 7, 1969

Mr. J. A. Perham, President - CANOX

Mr. R. C. Hesketh-Jones, CE Overseas - BOC

Dear Chris:

You will recall your letter of May 16th and the visit of Mr. W. E. Ford of Gases Division to Burdett.

A week ago, prior to a Harris Calorific Board Meeting, I spent the morning and lunch period with Mickey Loveman and his father. At the appropriate moment I told them of the message conveyed by Mr. Ford, &c. " and tell them to remember that there are still some Burdett operations which may be for disposal if BOC is interested." Mr. W. H. Loveman has no recollection of this remark. Naturally I covered up and there was no embarrassment -- in fact, it gave me the chance to tell them that if ever they had such thoughts BOC might possibly be an interested party. We very happily concluded that BOC would be advised in such an event.

We have a pretty friendly relationship with Burdett, but I don't think I would want to be much closer to them than we are now. However, Mickey Loveman is a good listening post for me and he passes on the odd scuttle butt in the trade.

Sincerely,

JAP/P

A4749

EX-217-A

MLS 60/64

19th Nov. 1964

THE USA - BOC GROUP POLICIES

I General Impression of the USA Gas Market

1 The industrial gas business is split between producers and distributors. There are no fully integrated production/distribution operations.

The anti-trust laws are a potent factor in debarring the large operators from strengthening their position by either vertical or horizontal acquisitions.

2 In the production sector (air separation gases) companies fall into three broad categories - large, intermediate and small. There are four producers in the "large" category :-

UC Linde
Airco
AP & C Inc.
Chemetron (NCG)

Only the large producers operate on a national scale.

There is at present a substantial overcapacity in air separation plants; also in VIEs and tankers because of 'NASA' cut-back and steel over-capacity.

Competition is fierce and profit margins tight. Pre-tax return on capital for the large and intermediate producers generally lies in the range 9% to 13%. (Big Three has a 13.5% return and Burdett, in a bad year, 3%). Even among the small producers, the general scene is one of poor returns; but there are a few bright patches.

3 There is a large number of distributors; characteristically small, low-cost operators with deep understanding of local markets and competing vigorously among themselves. The area served is often very small. Their profitability is difficult to judge; many are family-owned and family operated.

II Possible Methods of Entry into the Plan 70 Market

EX-217-8

1 The following methods of entry are conceivable :-

a supply scheme plus liquefier.

b buy an established major producer or intermediate producer (eg AIG, Burdett)

Comment on a and b

Appears to be ruled out because a substantial investment would be accompanied by but slender returns. P/E ratios of successful concerns are high. BOC could not find the dollars and could not face the probable - or possible - dilution of Group earnings. In tonnage BOC is conscious, from its operating experience in the UK and from recent experience with tendering in several countries, that commercially and technically there are unsolved problems. There seems to be no particular Group * strength here - not yet, anyway. In formulating a similar view on LO/LH, it would be well to suspend judgement for about two years until "Plan 70" experience is available.

c establish or acquire one or a few distributorships and use as a base for expansion, horizontally or vertically.

d subject to anti-trust laws, merge with a number of local distributors to form - or with the aim of eventually forming - an integrated production/distribution system (BOC supplying Plan 70 type production and bulk distribution facilities).

Comment on c and d

Further study seems justified, against the background sketched below.

* Reports to BOC missions indicate that margins are just as tight in the USA.

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CX-217-C

III Some points for Possible Further Investigation

1 Closer study ("desk" methods) of attitudes and performance of the large and intermediate producers.

2 Closer study, following or overlapping no. 1, involving a series of visits to some existing participants, large and small. To reduce the "upset" effect arising from knowledge of a BGC team's tour, stress would be laid on the point that we are seeking parallels for the changing business scene in the UK and Europe (and indeed this would be part of the motive).

3 Some kind of study of the "demography" of user industries, by "desk" or field work - or both. Examples from a wide range of possible types of study are :-

- a sample of users, graded by size, in a few selected industrial centres.

- the purchase from management consultants of informed opinions on buying sophistications.

4 Some comparisons with other industries to gain an impression of the possible time-scale for "shake-out" in the US gas industry (in future will there be fewer participants and higher margins - or will the present situation continue?)

5 Following some or all of the above, further desk research to identify particular markets (eg medical gases) in which detailed local field studies might follow later.

CX-217-D

IV Interaction with the Group business strategies

Here fundamental than the five points given above, however, is a better identifying of what BOC's incentives would be in particular types of venture; special attention to be given to the relationship with the implementing of selected business strategies of the Group. Since it seems probable that distribution would be involved, the following are some of the chief questions arising :-

1 What BOC Group's strengths would we be exploiting?

2 How genuine and relevant are those strengths? Do they offer a real prospect of adequate profits in the businesses (and mainly, it seems, they are businesses in which the current participants' experience is poor)?

3 Presumably (though not certainly - this would be for study) distribution would be both of gases and welding products - as is the case with existing distributors. What sources of supply? What advantages and disadvantages arising in terms of market exploitation (= reward of investment), and possibly also of technology/experience input for the Group as a whole (= some indirect lift to the reward of Group's investment elsewhere)?

4 What else might be distributed? Again, what sources? Why?

5 Do we mean just "distribution"; is there a broader, "service", concept?

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The answers that might emerge can only be roughly foreseen until more study has been done; what is probably worth noting now is that the possible types of answer are very diverse. It might be that a limited operation tied to goods exported from UK or elsewhere (eg Singapore?) would emerge; if so, the reasons for seeing an enduring basis for the international trade would need to be established, and the case for owning the outlets in the USA reviewed (cf. case Elly Inc. vs independent distributor). Or it might be that, drawing on Canox history in combination with much else, a specific case for entering distribution in the USA as a business in its own right would emerge. Ideally, there would be a venture envisaged into which BOC could put some pre-existing strength as a basic, initial "plus" and draw subsequently new strengths for the Group to use elsewhere in the world. "Strength" would probably mean simply some particular "know-how" capable of profitable application; preferably, however, it would have some tangible ingredient.

All this requires to be discussed and studied in advance, because the concept of what is the chosen ultimate aim can greatly affect the earlier stages of specific venture search and selection.

V Conclusions

Studies of two kinds should continue :-

i of the USA business scene, with the considerations outlined above strongly in mind. The phasing of "desk" studies with a tour of participants in the USA is left for discussion.

ii of distribution and "industrial retailing" as business themes for the Group's expansion generally. Some attention has already been given to the subject at Hammersmith House, and in Gases and Welding Products Divisions. There is more to be done, with a fairly high priority, and with special attention to international aspects in terms of possible exploitation and of input of comparative information.

APPENDIX A

BACKGROUND TO THE PRESENT PAPER

Following BCCI V, a meeting* was held at Hammersmith House at which priority was given to a study of the USA industrial and medical gases business; other UK areas of business for study to be selected later.

In consequence, as a first phase of "desk" study, the information described in Appendix B has been put together as a general Survey of the scene.

Timing

The Survey was completed in readiness for the (current) visit of Mr J.A.Perkins.

The present paper has been prepared in the light of a discussion involving also Mr L.E.Smith, and Mr P. Laister on 12th November.

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*(footnote) see notes on meeting BCCI/AC (notes dated 11.11.69); also see paper FLS 69/27 for background to BOCI discussion.

Attachment B

CX-2/7-G

A STUDY OF THE INDUSTRIAL GASES IN THE USA

(Ie on the documents dated 6th November 1969 and put together under the title "Industrial and Medical Gases in the USA - Statistics and Other Information")

Sources

A wide variety of published sources; also information generally available on subscription (eg Dun & Bradstreet company reports). The written reports, working documents and spoken recollections/impressions of many BOC visitors to USA over recent years.

Scope

1 The following US markets have been studied :-

- oxygen
- nitrogen
- argon
- helium
- carbon dioxide
- nitrous oxide

2 For each product information is provided on :-

- market size
- growth (past and future)
- methods of distribution
- end-uses

3 Information has also been collected on the location of markets; a state-by-state breakdown of demand for acetylene, carbon dioxide and ASU gases is given.

4 Less information has been collected on

- hydrogen
- carbon monoxide (this is believed to consist of specialized and highly localised operations).
- DA for welding/cutting.

5 Information on price structures, so far as it is available, has also been recorded.

6 Generally the amount of information unearthed from the sources is very large. The Survey does not attempt to reproduce it all; but its existence is indicated.

7 The general impression of poor profitability is reported in the main text of the present paper.

A4757

1st Dec. 1969

CY-218-A

I BOC AND CHEMETRON - GENERAL NOTES

a An approach to BOC by Chemetron's merchant bankers with some kind of offer or request for help will probably require a quick answer in view of Chemetron's presumed motive - the repelling of the bid by Sun Chemical. The bid has been stalled by litigation, but there may be renewed movement soon.

b Formulation of a general BOC policy background is difficult at present. Studies of the US business scene, with special reference to gases and related products, are proceeding; but it will be some months before substantial results are available. Nevertheless preliminary indications are that any BOC entry into USA gases and related products in next few years would be at the distributive end of the trade rather than in tonnage/bulk liquid.

c Chemetron, under the name National Cylinder Gas, are large nation-wide gas/liquid producers; probably ranking fourth after UCL, Airco and AP. Some of their operations - more, we believe, than with the major competitors - are to a degree vertically integrated with the final distribution of gases; also there is some evidence that they try harder than the others to identify themselves with their distributors.

d In this way, therefore, Chemetron might fit the strategy. But they are a very much larger concern than had been envisaged for the early stages of BOC participation in USA. Their interests extend to welding products, food services and engineering; there may be items here with attractions for BOC. Also there are subsidiaries and affiliates in UK, Latin America, Canada, Australia, Japan, Germany and Belgium.

e Chemetron's turnover split as stated in Annual Report :-

Chemetron - sales for year ended 31.12.68.

	%	$ million
Industrial & Medical Gases & related products	51	121
Chemicals	25	59
Metal Products & Process Equipment	24	57
	100	237

No split of profits is given.

No fuller definitions are available; eg some welding products could be defined either as "Metal Products" or as "related" to gases.

f Sun Chemical's motives could be :-

i seeking diversification into gases;

or ii seeking some integration in chemicals with their own business.

It seems almost certain (see papers following) that it is the latter, and only the latter.

g If so, possible case exists that BOC should talk to Sun/Sun's advisers rather than Chemetron/Chemetron's advisers; route to BOC control of NCG would then be via success of Sun bid. But Chemetron seem to be well placed defensively; company sale requires a ⅔rds vote of shareholders.

h Following papers show that difficulties of various kinds, great but possibly surmountable, would arise in formulating and implementing a scheme to obtain control, or a large minority share, of Chemetron. Despite limited prospects for a successful outcome, further study and discussion seem justified. The alternative route of joint action with Sun, Chemetron to be split subsequently, will probably also deserve study. Various types of scheme, possibly to involve BOC's Chemicals Division in some way, could be devised; it is probably too soon to be mounting closer studies in this way, however.

i BOC would have to satisfy itself on some fundamental questions of applicability of strengths; questions that affect all venture proposals and properly would precede acquisitions search. Does the Group have relevant strengths that can be exploited advantageously in the USA via NCG? Alternatively - or, better, additionally - what are the strengths that NCG has and that BOC can exploit in operations elsewhere? And a review of the non-gases operations of Chemetron would also be required.

CR-218-C

II - CHEMETRON AND SUN CHEMICAL - THE BACKGROUND

1 Introduction

Following merger suggestions, which were rejected by Chemetron, Sun are now attempting to succeed in a contested bid for control. This follows many other attempts to merge with or to acquire Chemetron - always strongly contested by the Chemetron Board, with the support of a majority of the stockholders.

2 Basic Information

a Chemetron

Incorporated in Delaware in 1933 as National Industrial Gases, name changed to National Cylinder Gas in 1934 and again to present style in 1958.

The corporation engages directly, or in joint ventures, in many of the activities of the BOC Group including gases, medical and welding products, carbide and chemicals; the chemicals operation being wider than in our case (it includes pigments, pharmaceuticals etc.) They have a food services activity, particularly strong in equipment for the meat packing and processing and dairy industries.

b Sun Chemical

Incorporated in Delaware in 1929 as General Printing Ink Corporation, the present name was adopted in 1945.

The company is particularly engaged in the production of pigments, printing inks dispersions etc. for the printing and packing industries. They also manufacture packaging materials and printing machinery.

3 Possible Basis for Sun Interest in Chemetron

Both companies are strong in the field of pigments and colours including colour dispersions, and indeed in defence Chemetron claim that such a merger would contravene the antitrust regulations.

Sun Chemical clearly have no links in production, know-how or marketing to make them see their future in industrial gases etc. Equally it cannot be the profits stemming from industrial gases which attracts them. It is logical to suppose, therefore, that their interest is largely in their traditional business areas.

Some options open to Sun might be :-

a Spin off the gases etc. part (antitrust prevents major US firm buying; possible opportunity for BOC or L'Air Liquide etc.).

b Joint venture of some kind: one version might be with BOC as managers of a relevant part of the business.

c A minority BOC holding with some sort of agreed platform for BoC growth in North America.

CX-218-D

III CHEMETRON AND SUN CHEMICAL
FACTS AND FIGURES

	Chemetron Corporation	Sun Chemical Corporation
Financial Information		
P/E Ratio (28.11.69)	10.7	14.4
Market value of equity (28.11.69)	$109.7 million	$53.1 million
Average growth rate of sales over 5 years	8.6%	10.0%
Capital employed (year end 31.12.68)	$218.2 million	$55.0 million
Cash (year end 31.12.68)	$10.3 million	$3.2 million
Sales (year end 31.12.68)	$237.6 million	$99.1 million
Gearing (year end 31.12.68)	28%	47%
Pre-tax, pre-interest profits (31.12.68)	$20.4 million	$5.6 million
Return on capital employed, (31.12.68)	9.4%	10.1%

Sun claimed in September to hold about 8% of Chemetron equity.

Chemetron President, having talked with Sun over some months, dismissed offer as "without merit" and as raising ".... severe antitrust problems". Chemetron's current law suit to restrain Sun refers to a 1966 case in which Chemetron had been restrained in an attempt to acquire a concern making organic pigments.

Elgin National Industries Inc., another suitor for Chemetron, claimed in April 1969 to hold about 3½% of Chemetron equity.

Press etc. sources with fuller material on these and other points are available in Hammersmith House.

Chemetron

National Cylinder Gas operate right across the United States with regional headquarters (at end 1967) at Philadelphia, Dallas, Atlanta, Chicago and Los Angeles. They have perhaps a tendency to smaller liquid plants than Union Carbide but equally appear to have perhaps a larger than average number of liquid stations for cylinder filling. However, they have at least five supply schemes to steelworks with plants of over 250 tpd, the largest being 665 tpd and four others with plants of over 100 tpd capacity. They have bought many of their plants from American L'Air Liquide. There is no clear evidence available to us whether they rely on the plant supplier for process design and contracting, or whether they have "in house" facilities. But in view of the regularity of their using one supplier it would appear that they have no such facilities. As with other companies they

may be engaged in "product swapping' to deal with peaks and drops in liquid demand. Their geographical spread in the industrial gases market appears to be better than their major competitors.

They seem to prefer to identify themselves strongly with their distributors who always seem to advertise their NCG affiliation and one is left with the feeling that NCG have tried to keep closer to the customer than some of their competitors.

Chemetron have long established strengths in welding supplies through their ownership of Alloy Rods Company and Allstate Welding Alloys Company, and are major producers of arc welding electrodes. They also manufacture gas welding and cutting equipment including cutting machines.

More recently they have acquired the Welding Products Division of *Harnischfeger which has brought them into the manufacture of welding machines and wire feed units as well as a wider range of electrodes and automatic and semi-automatic arc welding consumables. (Acquisition completed 6th January 1969)

*Harnischfeger Corp. Milwaukee, Wisconsin, manufacturers of cranes, hoists etc. also electric motors and controls. 1968 number employed 6,000 1968 Sales $134 million.

CHEMETRON CORPORATION

Principal Activities

Industrial and medical gases and related products

Related activities

Pigments Division - organic and inorganic flushed, dispersed and dry pigments. Colour intermediates, vehicles, varnishes, driers, pulps, press cakes and extender pigments.

Organic Chemicals Division - chemicals for the farm, drugs for the pharmacy and plastics for home and industry.

Unrelated activities

Inorganic and metal treating chemicals - serves the aviation, aerospace, automotive, appliance, metal-working and other industries with a complete range of metal-cleaning and electroplating products such as etchants, paint strippers, corrosives, anodes and plating salts.

Catalysts Division - produces specialty catalysts used in the petrochemical, food, chemical and pharmaceutical industries.

General Chemicals Divisions - compounding materials for the rubber and plastics industries, adhesives, interior and exterior coatings for buildings.

Industrial Gases Division - oxygen, nitrogen, argon, commercial grade acetylene, carbon dioxide

Medical Gases Division - serves the medical, dental and veterinary professions.

Medical equipment - oxygen dispensing equipment, anaesthetic equipment, air compressors, air dryers, vacuum pumps.

Welding equipment and welding supplies

Gas storage equipment

Fire fighting equipment

Electric flashbutt rail-welding equipment

Fittings and flanges, forgings

Process equipment for the food industry.

SUN CHEMICAL CORPORATION

Manufacture and sale of printing inks and special chemicals

Printing inks, dispensers, pigments.

Chemicals Division - textile and paper chemicals.

Packaging materials group:
Artistic Manufacturing Products Division - gift wrapping papers, ribbons, tags and novelties

Kacile Division - coated and laminated films and fabrics, industrial and decorative tapes, nuclear and space specialties, film - foil laminates for electrical insulation and heat reflective fabric.

Machinery and International Groups
Rutherford Machinery Division - machinery for the graphic arts industry.

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(Revised 3.1.'69.)

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IV - BOC AND CHEMETRON - A POSSIBLE SCHEME

Our latest information on Sun Chemicals offer for Chemetron is set out in Appendix 1. The offer is worth $42.06 per Chemetron common share ($1 par value) and values the company at $152 million (£63.3 million). This gives an exit P/E to Chemetron shareholders of 15 times estimated 1969 Earnings of $10.1 million (£4.2 million) representing EPS of $2.80. Reported earnings in 1968 were also $10.1 million (£4.2 million).

We have considered various ways in which BOC could offer to acquire a controlling (more than 50%) interest in Chemetron and at this stage, the only practical possibility appears to be for BOC to offer a US $ convertible unsecured loan stock for 55% of the Chemetron common shares outstanding. It is likely that the loan stock would have to bear an interest rate of 9% and be convertible into BOC shares after five years at 10/6d. Appendix 2 shows the effect of consolidating Chemetron with BOC using estimated 1969 figures. The asking price, understood to be of the order of $42 per Chemetron common share, would require loan stock with a nominal value of $83.6 million (£34.8 million) to acquire 55% of the common shares outstanding. The price of $42 represents an exit P/E to Chemetron shareholders of 15 on forecast 1969 EPS of $2.80; (this figure is the latest information; $3.00 had been indicated previously).

The effect on BOC of the acquisition can be summarized as follows:

1) PLAN EPS would be increased by around 6% each year 1970-1974 as the post tax cost of servicing interest on the convertible would be less than Chemetron Earnings Attributable to BOC based on 1969 Forecast EPS of $2.80 and 4% per annum growth thereafter. After conversion, BOC EPS in 1975 would be diluted by 12%.

2) After the acquisition of* Chemetron, debt on BOC's consolidated balance sheet would be £135.4 million against BOC Equity and Preference Capital of £85.5 million. This would place a complete restriction on BOC's ability to raise further debt in the UK and would involve negotiations to adjust the Trust Debenture Deed and also the Tonnage Debenture Deed. The former would principally involve exclusion of Chemetron debt from the formula and the latter would involve the restriction that consolidated debt must not exceed BOC's capital and reserves.

There are a number of variables in this situation which are now under study:

1) Forecast earnings and funds requirements of Chemetron.

2) In view of Sun Chemical's offer of $42 per Chemetron share, would BOC have to offer more than $42 per share? The implication is that $42 per share is basically acceptable, but not from Sun Chemical and that anti-trust considerations can be used to negative an offer from that quarter.

3) The conversion price into BOC shares might be set at a higher price than 10/6d, which has been used for figures in Appendix 2.

*ie, of 55% of the common shares

CX-218-H

4) If BOC could count on a 15% block of Chemetron's shares remaining in friendly hands it [illegible] have to acquire say 36% of the total common shares outstanding. This would reduce the value of securities to be issued by BOC and also overcome problems with the Trust Deeds as Chemetron's debt would not be reflected on BOC's Consolidated Balance Sheet. However, BOC could still consolidate the attributable earnings of Chemetron, but its sales would not be consolidated.

5) The offer of a convertible loan stock of BOC to US Shareholders may not be acceptable to the US Authorities. In this case, BOC would have to have its loan stock placed in the Eurobond market so that it could offer cash. Even if the loan stock is acceptable, US Shareholders would probably incur US Interest Equalization Tax at 10% on the market value of the securities. This, in effect, reduces the cash value of BOC's offer by 10%, ie, £42 per share is only worth £37.80 to the US Shareholders after they have paid interest equalization tax.

6) Appendix 2 shows BOC's gearing at 49% after consolidating Chemetron. While this would appear too high for more than a temporary phase, solutions would include, sale of a UK trading entity with cash proceeds applied to retirement of UK debt, sale of shares in OACs for the same purpose, and applied to retirement of Chemetron's debt.

*This is very much subject to confirmation and cannot generally be so implemented by UK Holding Companies.

Central Finance
PAW/PL
27.11.69.

A 4765

(to Paper IV)

CX-218.1

SUN CHEMICAL OFFER FOR CHEMETRON

Latest information on Sun Chemicals offer for Chemetron which is conditional upon 51% acceptance is as follows:-

For each Chemetron common share $1 par value (3,022,873 outstanding).

0.5 Sun Chemical Common Stock market value at 24 November 1969:	$17.06
$25 nominal value 8% subordinated 25 year debenture:	$25.00
	$42.06

Market value of bid $152 million.

Book value of equity at 31 December 1968, $138 million.

Chemetron shares at 24 November 1969 were quoted at $30⅝* representing a 10.9 P/E on reported 1968 EPS of $2.80 and also on forecast 1969 EPS of $2.80.

The bid represents an exit P/E to existing Chemetron shareholders of 15 on forecast 1969 EPS of $2.80.

* Compare 1969 "high" 50 approx.
1969 "low" 28¼.

Shareholders have presumably assumed failure of the $42 bid. It is not known here why Chemetron shareholders were apparently disinclined to accept.

CX-218-J

BOC ACQUISITION OF 55% OF CHEMETRON
BY SOUTHERN PACIFIC LAND
STOCK CONVERTIBLE INTO BOC SHARES
AT 10/- IN 1975

(£ million)	BOC 1969 PLAN	CHEMETRON Est. 1969	BOC including CHEMETRON
Equity	84.7	59.4	82.5*
Preference	2.5	0.4	2.9
Minority	14.6		41.4
Tax Equalization	7.9	7.0	14.9
Other Liabilities		0.5	0.5
Debt	65.4	37.2	102.6
New Convertaible			34.8
Capital Employed:	175.1	104.5	279.6
Gearing:	37%	35.6%	49%

*after write-off of £2.2 million goodwill.

Effect on BOC Earnings:

(£'000)	BOC Attributable Earnings	Chemetron Earnings Attributable to BOC (1)	BOC EPS	BOC EPS including Chemetron
1969	5,878	379	7.4d	7.9d
1970	7,421	463	8.8d	9.3d + 5.6%
1971	8,675	551	10.3d	11.0d + 6.7%
1972	10,525	642	12.5d	13.3d + 6.4%
1973	12,433	736	14.7d	15.6d + 6.1%
1974	14,373	835	17.0d	18.0d + 5.8%
1975	15,523	2,660 (2)	18.3d	16.1d - 12.0%

(1) growing at 4% per annum from 1969 Forecast EPS of £2.80 and after allowing for 15% US withholding tax on dividends and cost of servicing interest on Convertible Loan Stock.

(2) assumes conversion of Convertible Loan Stock into 67,900,000 new BOC shares representing a 33% increase in the number of BOC shares outstanding.

(to Paper (v))

CONSOLIDATED CONSOLIDATION SCHEDULE — FINANCIAL SUMMARY — (Currency - £ million Conversion Rate £ = $2.40 U.S.$.....)

Year ending 31/12

	1964		1965		1966		1967		1968		Growth Rate % P.A. 1964 to 1968
	%	£M	%	£M	%	£M	%	£M	%	£M	
BALANCE SHEET											
Net Fixed Assets	51	29.2	52	35.4	51	40.2	53	44.2	53	47.8	13.1%
Investments	17	9.9	20	14.0	17	13.5	16	13.2	14	13.0	
Net Current Assets	32	18.5	28	19.4	32	24.9	31	26.6	33	30.1	13.1%
CAPITAL EMPLOYED	100	57.6	100	68.8	100	78.6	100	84.0	100	90.9	12.1%
SOURCES OF FUNDS											
Equity	64	36.6	61	42.0	57	44.5	65	54.6	63	57.5	12.0%
Preference	1	0.7	1	0.7	1	0.6	1	0.5	1	0.4	
Minorities	1	0.5									
Borrowing	27	15.5	33	20.4	34	27.1	24	22.0	28	25.5	13.2%
Long Term Liabilities	7	4.3	5	5.7	7	6.4	9	6.9	3	7.5	
TOTAL FUNDS	100	57.6	100	68.8	100	78.6	100	84.0	100	90.9	12.1%
PROFIT AND LOSS ACCOUNT											
Sales (actual/estimated)	100.0	70.4	100.0	86.9	100.0	96.9	100.0	95.9	100.0	99.0	8.8%
TRADING PROFIT	12.2	8.6	14.6	12.7	15.3	14.8	14.2	13.6	11.3	11.2	6.8%
Depreciation		3.6		4.1		4.4		4.9		5.4	
Other Income		2.5		2.9		3.3		2.5		2.7	
PROFIT (Pre tax, Pre interest)	10.6	7.5	13.2	11.5	13.1	12.7	11.7	11.2	8.6	8.5	3.2%
Interest		0.8		0.9		1.4		1.4		1.4	
PROFIT (Pre tax)	9.5	6.7	12.2	10.6	11.7	11.3	10.2	9.8	7.2	7.1	1.5%
Tax		3.3		5.1		5.3		4.3		3.5	
Minorities/Equity in undistributed earnings of unconsolidated subsidiaries.		.2		.3		0.7		0.4		0.6	
Preference Dividend											
Earnings (Equity)		3.6		5.8		6.7		5.9		4.2	3.9%
Dividend (cost)		1.3		1.6		2.1		2.5		2.7	
Retentions		2.3		4.2		4.6		3.4		1.5	
FINANCIAL RATIOS											
Return on average capital employed (Pre tax, Pre Interest)		13.1%		12.2%		12.2%		11.8%		9.7%	
Sales to average capital employed		1.2x		1.4x		1.3x		1.2x		1.1x	
Sales to net fixed assets		2.4x		2.5x		2.4x		2.2x		2.1x	
Stock turned over		5.3x		5.3x		5.5x		5.0x		4.8x	
Debtors expressed in terms of weeks Sales		7.2		8.6		8.6		8.9		7.1	
Effective tax rate		49.3%		48.1%		44.7%		43.5%		49.3%	
Return on Equity Funds (Earnings)		9.8%		13.8%		13.1%		10.9%		7.4%	
STOCK AND INVESTOR STATISTICS											
Share Price (Year end price) *		£11.6		£13.6		£17.7		£20.3		£17.7	14.2%
Market Capitalisation		£25.5M		£54.4M		£62.9M		£72.4M		£11.4M	14.0%
Earnings Yield		10.2%		10.7%		10.7%		8.1%		5.9%	
Dividend Yield		5.8%		2.6%		3.2%		3.4%		3.7%	
Dividend Cover		2.7x		3.6x		3.2x		2.4x		1.6x	
P/E ratio		9.8		9.9		9.3		12.8		16.9	
Earnings per share *		£1.18		£1.89		£1.91		£1.65		£1.12	

*Adjusted for scrip issues etc.

NOTES (see attached)

A 4767
CX-218-K

FINANCIAL SUMMARY (CONTINUED)

MOVEMENT IN NUMBER OF COMMON SHARES ($1 PAR VALUE) OUTSTANDING

1964	End of year	3,062,860
	Share options exercised	23,540
	Other movements	51
1965	End of year	3,086,451
	Share options exercised	26,120
	Acquisitions and Other movements	73,019
1966	End of year	3,185,590
	Share options exercised	4,960
	Conversion of $14,620,000 5⅛ Debenture	375,734
1967	End of year	3,566,284
	Share options exercised	1,360
	Acquisition	55,650
1968	End of year	3,623,294

At 31 March 1969 there were 3,622,873 outstanding.

Share Price		High		Low	
		£	$	£	$
1964		12.6	30⅛	10.5	25⅛
1965		26.0	62½	11.3	27
1966		27.0	64½	12.5	30
1967		24.5	58¾	16.2	38⅞
1968		23.5	56½	15.9	38⅛
1969	24 November	£12.8		$30⅜	

NOTES:

(1) In 1965 the company sold its controlling interest in Pan Geo Atlas Corporation, Texas, in exchange for securities worth £3.1 million ($7.5 million) of Westec Corporation. When the latter filed for bankruptcy in 1966, these securities were written off to retained earnings. No profit had been recognised by the company on this sale in 1967.

equipment

(2) The company is committed to pay/lease rentals in 1969 of £496,000 ($1,192,000) and over the remaining life of the leases a further £3,654,000 ($8,771,000). These leases have not been capitalized as Long-Debt Obligations on the balance sheet.

(3) In 1969 the company raised £16.6 million ($40 million) by way of 9% Debentures due September 1994.

(4) The company will have £14.2 million ($34 million) outstanding on a Bank Term Loan at 31 December 1969 which falls due in semi-annual instalments of £830,000 ($2,000,000) with a final repayment of £8.3 million ($20 million) at December 31, 1973.

(5) On January 6, 1969 the company acquired the Welding Products Division of Harnischfeger Corporation for £3.1 million ($7.5 million) in cash and a similar amount of Convertible Preferred Stock.

A 4769

(Revised [illegible])

V - CHEMETRON - BROAD FINANCIAL CONSIDERATIONS CX-218-M

1 In an investment context, it appears a unique and almost certainly non-recurring opportunity to acquire a substantial publicly-quoted vehicle in the non-sterling area; also, if BOC, in the event, finds the underlying business relatively unattractive, it can always partially dispose of assets and re-invest.

2 To acquire 55% of Chemetron at $42 per share would cost £35 million. Gamon is far too small to be considered as an investment lever. A scheme like BP's acquisition of Sohio in which, effectively, BP sells oil in exchange for shares, is not feasible.

3 Possible methods of consideration appear to be:

a BOC loan stock unsecured, convertible into BOC ordinary shares (but not within 5 years), and subsequently listed only on a US stock exchange. This tranche of paper would therefore be held by non-UK residents for 5 years unless UK residents were prepared to pay the investment dollar premium.

b Placing an unsecured bond with US institutions (possibly convertible).

The cash proceeds would be used to purchase Chemetron shares, otherwise basically similar to (a) above.

c European Bank Consortium 15 year Placing, unsecured, with repayment of principle in years 7-15 from spot sterling, ie, cash is raised in Europe to purchase Chemetron shares ultimately fundable in sterling. As interest payable to bank, probably no problem in paying interest gross, and to obtaining tax relief thereon.

d Convertible Euro-bond, (normally raised through Luxembourg or Netherlands Antilles subsidiary, so that interest can be paid gross).

Certain considerations arise in regard to security and Trust Deed Margins.

NOTE: Euro-overdraft finance would probably have to be used as bridging finance for (c) and (d) as 12-18 months might elapse before bond could be issued (owing to queue for this sort of finance).

The above, (a) (b) (c) and (d) indidates the sources which might be included in some form of package.

4 A basis of purchase of the order of 15 times earnings presents the proposition in a hopeful light.

5 If less than 50% interest is acquired it is almost certain that BOC could not consolidate attributable earnings, but only a dividend stream. This would result in initial moderate dilution of EPS, but if conversion into BOC ordinary shares is an element in the terms, significant dilution in EPS would occur on conversion.

CX-218-N

6 If a 55% interest is acquired there would be substantial dilution of EPS and relatively moderate EPS dilution on conversion into BCC ordinary shares (if conversion was in fact part of the purchase terms).

However, it would be absolutely essential to vary the terms of BCC's General Debenture Trust Deed, as this provides for a three year average of BCC's published profits as a main constituent of the profits basis computation of borrowing margin.

There appears to be no reason why, in return for payment of 2% more interest on existing UK secured debentures, the trustees could not obtain agreement to exclude Chemetron from the provisions of the Trust Deed formula for calculating margin, particularly bearing in mind the standing of Chemetron as a sizeable public company in its own right. The trustees have already excluded CIG in this way.

A 4771

Chairman
Vice-Chairman
Mr L. E. Smith
Mr P. Laister

CX-221

18 December, 1969

Mr R. Johnson,
Loeb, Rhoades & Co.,
Forty-Two Wall Street,
NEW YORK, NY 10005

Dear Mr Johnson,

You may recall that when we had the pleasure of seeing you over here in Hammersmith the possibility was mooted that one of us might be in the States on business in January, and that, if so, we could take advantage of such an opportunity to make an early and informal contact with Chemetron.

It so happens that I myself will be in New York on 6/7 January. If, therefore, it would be possible to meet the President of Chemetron in Chicago on 8 January, I would be delighted to extend my journey to do so.

You will understand that we would view this visit essentially as one of personal introduction so that I may have the pleasure of meeting Mr Gallagher and perhaps some of his colleagues so that our thinking in London can be better informed. Naturally, since your visit, we have been doing some figuring and studies here, but these are at a very early stage and do not yet provide us with any material on which to base anything substantially more than social discussions.

I shall look forward to hearing from you whether this date would be feasible for Chemetron.

With best wishes,

Yours sincerely,

(J. M. Williams)

5th January 1970

H.S.Rich

A 4772

CX-222

Mr J.H.Williams

Copies to: * Mr L.E.Smith
* Mr P. Laister

RESTRICTED

CHEMETRON

We have been working on questionnaires for you to leave with Chemetron. We face a problem of striking a balance; the shorter the questionnaire the better the chance of quick, full and friendly response - yet the less the information to be obtained.

What we have done is to provide two very different questionnaires, so that there is an option that you can exercise, if you so wish, on the spot according to the atmosphere of the meeting. Only one of the two questionnaires would be handed over :-

One (coded "Document Q.20") is a short "Introductory Questionnaire", together with three financial schedules for completion.

The other (coded "Document Q.85") is much longer and has 13 schedules for completion.

If "Q.20" is left and duly returned to us completed, then a second phase of investigations could well see a much longer questionnaire - but probably not "Q.85", rather one to be specially aligned to the information arising from "Q.20".

We are providing you with two sets of each (ie "Q.20" plus three schedules, all twice; "Q.85" plus 13 schedules, all twice)

"Q.20" is so arranged that brief answers could be written or typed on the original and a copy sent back to us. Parts of "Q.85" are similarly laid out, but there are some questions which call for schedules or long lists.

My memo dated December 3rd to Mr Smith, and the papers with it (you have a set), provide a general survey. There is no new information which would cause us to amend or extend this now. However, you will probably want more detail for a visit. Due to holidays and sickness we have not been able to prepare abstracts of detailed information; what I am proposing to do, and believe will be acceptable to you, is to lend you our source file from Commercial Intelligence. I have been through this file and marked a symbol thus Ⓒ on top right-hand corner of the more significant items (eg Gallagher, ex Hennessy, appointed President in July 1968). Also, the file contains the 1968 Annual Report (p.2 for list of Directors, etc., p.3 for subsidiaries etc.)

H.S.Rich

* Questionnaires and schedules not attached; one set is

A 4773

/RESTRICTED/

L. E. S.

VISIT TO CHEMETRON ... 8 JANUARY, 1970

CX-223-A

Charles Haines — Chairman
J. Gallagher — President
R. S. Johnson — Loeb Rhoades
JMW

An extended and private lunch time meeting, which must be considered a success to the extent that it was possible to present BOC and its potential utility to Chemetron in an open, direct and friendly atmosphere.

Although Haines still thinks that BOC's office is in Millbank, and the airport at Croydon, on many matters more parochial to Chemetron he remains knowledgeable and sharp. Gallagher, if anything, knew rather less about the business than one might have expected after eighteen months' sojourn, although the immense diversity of it - a diversity which seems to have been emphasised in its growth - makes the task of understanding a formidable one.

The incentive for Chemetron to do anything was explored. As a result of the two takeover bids, Sun Chemical and Elgin have acquired some 11% to 12% of the stock. This was purchased at prices above the current market. Chemetron are unhappy at this hanging over the market, which fact will be well-known to professional investors, who are therefore likely to avoid the stock.

They therefore feel that their stock is under-priced and is liable to remain so. This in turn, they accept, may cause critical comment in the press and from stockholders. They are conscious that such may take up management time.

While all these reasons appear to add to an interest in getting these shares into firm hands, it is not evident that the pressure to do this is such that any sacrifice of independence could be justified.

Right at the end of the lunch, the point was firmly made by Johnson that BOC would be interested in nothing less than control, although we would be interested in a situation out of which control came at a later date.

Equally, BOC did not feel that 100% ownership was necessary in order to meet their requirements and, hence, Chemetron could remain a publicly traded company.

This statement caused a bit of a stir from Gallagher, but Johnson thereafter suggested that this might have been for the benefit of Haines rather than a true view.

Gallagher would make the point that if he was talking about control rather than a block of shares he had many more options open to him, although it is clear that in the air business he has few.

The questionnaire Q20 was left with Gallagher as an indication of the sort of things that we would require to know if we were to take our interest appreciably further. Johnson said he thought that such a document should be filled in by an analyst from Loeb Rhoades rather than by a company to another company being a potential shareholder. This statement, made on legal grounds, was not pressed and may have been more about employment for Loeb Rhoades than anything else.

At the same time, he, Johnson, said that there was nothing illegal, in his view, in not announcing that there were talks between the companies at this stage. I said firmly that we were not at a state where we could accept publication of talks which, in our view, had not yet happened.

Considering the time taken, it was remarkable how little information came back from Chemetron, but that which did:

1. Earnings are expected to increase this year to $3.10 from the present $2.80.

2. Welding Products business is included in their gases and related products category.

CX-223-C

3 Gases etc, business is more profitable than the other businesses.

4 CO_2 is probably the most profitable of all. They are No 2 in the market, a whisker behind and about to overtake Liquid Carbonic. They claim that this market is growing at 10% per annum and that their strength is being based on by-product sources.

5 No rationale could be perceived on their chemical acquisitions.

6 In their metal side, part of the present depression of earnings is due to Tube Turns having had a very high profit margin in a semi-monopoly situation, having become a dealer in commodities, others having entered its market with vigour.

7 Their food business they see primarily in the Votator, together with a liquid nitrogen food freezing business.

8 Our records did not include their 50% interest in Mid-West Carbide, well-known to Chemicals Division. They are sold out at both plants.

Action agreed was that Chemetron would consider the questionnaire, the sort of people we were, and the sort of proposition we could consider, and would get in contact with Johnson and/or myself to see whether they wished it taken further.

For what it is worth, Johnson thought the meeting went well and believed they were likely to come back for more. He well understands that we would not be attracted by an arrangement which depresses our earnings. He is thinking that, should any offer develop, it would be in terms of cash and that this would be seen as a disadvantage by some shareholders because they would be liable to a 25% capital gains tax. Such a tax could be avoided by the issue of stock, bonds, debentures and perhaps convertibles.

JMW/12 January, 1970

Copies : Mr L. E. Smith
Mr P. Laister
Mr R. C. Hesketh-Jones
Mr H. S. Rich

A 4776

CX-224

LOEB, RHOADES & CO.
FORTY TWO WALL STREET
NEW YORK, N.Y. 10005
TELEPHONE 530-4000

January 16, 1970

Mr. John M. Williams
Managing Director
British Oxygen Company, Ltd.
Hammersmith House
London W.6.
England.

Dear John:

Largely because of the excellent personal impression which you made upon both Charlie Haines and John Gallagher, our visit to Chemetron last week has come in for a good deal of discussion at the Executive Committee level.

The net of it, however, is that if for any reason and at any time British Oxygen should be interested in taking a minority position (I would say even up to 35% or 40%), they would be interested in talking further; but the notion of arithmetic control of Chemetron being overseas is one they are simply not ready for at this time.

Quite obviously, their willingness to talk at all reflects John Gallagher's expressed concern with the problem of "stability of ownership". If they are actually to sell out, they feel it might be possible to develop more attractive offers in the U.S. than would be probable from B.O., in a tax-free exchange of securities.

I am sorry not to be more positive, but this is where we stand. I would appreciate your reactions, and in any event will make a point of coming out to see you during my next trip to London.

I enjoyed our day in Chicago, and trust you had a good trip back.

Sincerely,

Robert S. Johnson

A 4777

CX-2254

Copy - Mr J.N. Williams

L. E. Smith

20 January 1970

Mr J.A. Forham, Canox

RESTRICTED

LES/ES

Dear Allan,

CHEMETRON

I had not realised that you were not fully in the picture in our discussions with Chemetron; your letter of 12 January refers.

We were approached first by a Mr Johnson of Loeb Rhoades & Co., following an introduction by Al Muller. During a discussion in Hammersmith House, Mr Johnson explained that he was a close friend of Mr Gallagher, President of Chemetron. Mr Gallagher, an able man in Mr Johnson's view, was concerned at the disruption caused by Sun Chemical Co. and Elgin Bank who, between them, had purchased 12% of the Chemetron stock and had advertised their intention of buying control.

Mr Johnson went on to say that Gallagher was confident that Sun and Elgin would be defeated but that Chemetron remained vulnerable so long as they had a very widespread list of small shareholders. In his view, they needed a large shareholder who was knowledgeable in the market for industrial gases and related products, if Chemetron was to obtain full protection against unwanted bids. According to Johnson, Gallagher was prepared to see control of Chemetron vest in a single knowledgeable shareholder. Having surveyed the list of possibles, and bearing anti-trust in mind, they had concluded BOC was their best choice. Much emphasis was placed on the importance of continuity of present local American management.

It will be obvious to you, as it was to us, that an outlay of £140/150 millions for 100% purchase can hardly be contemplated. Nevertheless, part-purchase now, aimed at eventual control, could be interesting; we said so, and expressed a willingness to continue talking. Accordingly, John Williams called on Chemetron on 8 January during his recent visit to USA.

He found Haines (Chairman), Gallagher (President) and Johnson (Loeb Rhoades) very amicable and prepared to talk, though woefully ignorant of BOC. The situation was much in line with what/

what Johnson had told us in London, though it was clear that they had not thought through all the consequences of a loss of independence; nor was it clear what incentive had prompted Johnson to propose the sale of a controlling interest to us in London.

John left them with a prepared questionnaire, listing the major items of information we would require if the matter were to proceed further. The probability is that, having completed the questionnaire, Gallagher will bring it to London for further discussion.

We are doubtful if these talks will lead to a definite conclusion, yet we are reluctant to close them off without exploring all possibilities, and certainly not until we have the Perham/Greenfield report on the USA market. So, we shall continue talking and thinking. Meantime, as you will now fully appreciate, we think it unwise for you and Dore Greenfield to approach them for their views on the USA market, which will surely come in another form.

Regards,

Yours sincerely,

A 4779

Mr L. E. Smith.
Mr P. Laister
Mr R. C. Hesketh-Jones
Mr H. S. Rich

L. E. S.
23 JAN 1970

CX-226

22 January, 1970
JMW/HFJ

Mr Robert S. Johnson,
Loeb, Rhoades & Co.,
Forty-two Wall Street,
NEW YORK, NY 10005

Dear Bob,

Thank you for your letter of 16 January and for transmitting the news from Chicago.

Thank you also for arranging the opportunity for me to meet with Charles Haines and John Gallagher. I appreciated it, but fully understand how they would have come to their conclusion.

You, I think, now know our position should the situation at your end change.

Meanwhile, I look forward to seeing you when you are next over here in London.

With best wishes,

Yours sincerely,

(J. M. Williams)

A 4780

Mr L. E. Smith

CX-227

28 January, 1970

J. M. Williams

Mr J. A. Perham,
CANOX

L. E. S.
29 JAN 1970

Dear Allan,

Leslie wrote to you on 20 January about the Chemetron situation.

You will like to know that I have since had a letter from Bob Johnson of Moeb, Rhoades expressing politeness but not enthusiasm for BOC having anything larger than a 35/40% stake.

The matter, therefore, has been put on one side.

Yours sincerely,

(J. M. Williams)

PS Leslie and I will arrive in New York on Wednesday, 25 February, for JV board meetings over the next two days. I have written to Al Muller to ask whether it would be convenient for him to have dinner with us on 25 February to discuss his consultancy. Would it be your wish to be present ? I will let you know what Muller replies as soon as I hear.

A 4781

ALBERT MULLER
Still Hollow Road
Lebanon, N. J. 08833
U.S.A.

CX-228

February 26, 1970

Mr. Leslie E. Smith
The British Oxygen Company Limited
Hammersmith House
London W6, England

Dear Leslie:

In the period since I last reported, my personal activities have included working with Messrs. Perham and Greenfield on the industrial gases survey, and continued the investigation of two refrigerators for Dr. Gardner. I also have had several discussions with welding equipment distributors in the New York area who have expressed interest in BOC equipment as an aftermath of Mr. Greenfield's visit.

The latter situation is rather interesting and I am taking the liberty of enclosing a copy of the letter which I have just sent to Mr. Reckitt which covers this matter.

Invoices for my consulting fee for the month of February and expenses for the period January 16 to February 15 are enclosed.

With best regards,

Sincerely yours,

Albert Muller

AM/tk
Enc.

cc: Mr. R.C. Hesketh-Jones
Mr. J.A. Perham

A 4782

CX-229-A

ALBERT MULLER
Still Hollow Road
Lebanon, N.J. 08833
U.S.A.

February 26, 1970

Mr. N.F.J. Reckitt
The British Oxygen Company Limited
North Circular Road
Cricklewood, London NW 2
England

Dear Norman:

This will acknowledge and thank you for your letter of February 6th regarding Vibramatic. I have discussed this further with Mr. Berryman and suggested to him that he deal with you directly on this subject.

As an aftermath of Mr. Greenfield's recent visit, I have had further discussions with several major distributors of gases and welding products in the New York area. During the course of these discussions I learned that AGA is attempting to introduce their line of equipment into the United States on a fairly aggressive basis. They have offered the usual assortment of regulators, flowmeters, torches and other devices to distributors in the New York area at attractive prices. Apparently, these distributors have considerable interest in this line since it is well constructed and attractively priced.

One situation I should like to report in more detail. Mr. H. Elliott, one of the owners of Cryo-Dyne, Bridgeport, Connecticut, asked whether or not British Oxygen had gas regulators and flowmeters available which could be employed by the electronics industry. My purpose in reporting this is to indicate again that there appears to be an opportunity for you to sell certain hard goods in the US if you are willing to adjust the design of this equipment to reflect the requirements of the market. The New England area contains a fairly large concentration of companies who manufacture electronic components, and in this activity employ gases which have to be controlled with a precision that goes beyond that possible with the conventional regulators and metering devices. The avoidance of contamination is particularly important in operations involving solid state devices such as transistors. The present systems for piping gases to the production areas are causing difficulties.

Elliott purchased a 50% interest in Seaburg Welding Supply in 1955 after having

CX-229-B

February 20, 1970

spent many years in the welding industry. He called me because I have known him for many years and he knew that I was engaged in work for BOC. In the period since 1955, Dryo-Dyne has acquired three other major distributorships in the New York and lower New England area. They sell a little over $2-million worth of goods yearly and are one of the largest distributors of gases and hard goods in the New England area.

I do not know what your reaction will be to the above, but would appreciate hearing from you in this regard.

Sincerely yours,

Albert Muller

AM/tk

cc: Mr. Leslie E. Smith
Mr. R.C. Hesketh-Jones
Mr. J.A. Perham

A 4784

Mr L. A. Smith
Mr J. A. Perham
Mr C. A. B. Leslie

CX-230

21 April, 1970
JR/EJ

Dr A. Muller,
Still Hollow Road,
Lebanon, N.J 08833,
USA

Dear Al,

I am writing to record the nub of our conversation last Thursday.

We are happy that you are agreeable to undertake spot assignments for BOC on the terms indicated in your letter of 20 March.

We are arranging that all requests for such help come to you through the Chief Executives here in the UK, or from Allan Perham, and that in all cases a copy of the request reaches me.

It would make it easier for us to review progress of this work if you could keep me informed from time to time of the execution of the various requests reaching you.

Our discussions last Thursday touched on two other points:

Firstly, we understand that our arrangement does not entitle us to any information on other consultancies which you may from time to time take on, but we are sure that our relationship is such that business and technical information belonging to BOC will be kept properly confidential and that substantial conflicts of interest will be avoided.

The second point concerned payment of finder's fee in the case of possible acquisitions. We understand from you that there is a normal scale for such a fee in USA and, further, that it is payable by the vendor of the business. And, further, again, that in the case of a complex situation such as would probably develop the fee would be split among the various introducing parties.

It was good to see you again here in London and I am sure we can arrange to meet later in the year to review progress in the new style of things.

Yours sincerely,

D

A4785

CX-233-4

LAZARD BROTHERS & Co., LIMITED
(INCORPORATING EDWARD DE STEIN & CO.)

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11, Old Broad Street,
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TELEPHONE: 01-588 2721
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TELEX: GENERAL 28675
FOREIGN EXCHANGE 262398

PJG/JA

28th April, 1970.

PRIVATE AND CONFIDENTIAL

J. M. Williams, Esq.,
The British Oxygen Company Limited,
Hammersmith House,
London, W.6.

Dear John,

BURDETT OXYGEN COMPANY

Following our telephone conversation, I enclose the papers relating to Burdett Oxygen Company.

As I mentioned to you, Kuhn Loeb are in touch with holders of 50% of the Company who wish to sell. Though nothing very concrete has been discussed on the question of price, Kuhn Loeb believe that the 50% interest could be acquired for between $4 million and $5 million. Profits are negligible and it would not on the surface appear a very attractive proposition.

In the event of your not wishing to pursue the matter, I would be very grateful if you would return to me the enclosed papers as Kuhn Loeb would like them back in order to offer the Company on the Continent.

With kind regards.

Yours sincerely,

Peter

A 4786

CX-233-B

BURDETT OXYGEN CO. OF CLEVELAND, INC. — Sales and Earnings — November 30 — (Unaudited)

	Nine Months		Three Months	
	1969	1968	1969	1968
Sales and Other Revenues	$11,480,314	$10,818,721	$3,910,623	$3,804,191
Net Income Before Extraordinary Item	19,984	156,550	16,259	153,041
Per Share	.02	.19	.02	.19
Net Income From Extraordinary Item	—	179,536	—	66,181
Per Share	—	.22	—	.08
Net Income Including Extraordinary Item	19,984	336,086	16,259	219,222
Per Share	.02	.41	.02	.27
Shares Outstanding	809,813	803,031	—	—

Nine Months Ended November 30, 1969

COPY

KUHN, LOEB & CO.
FEB 26 1970
LIBRARY

A 4787

CX-233-C

To Our Shareholders:

Sales and revenues for the first three quarters of the fiscal year rose to a record $11,480,314, up over the $10,818,721 of the year-ago period.

Net income for the nine months amounted to $19,984, or two cents a share. In the like period last year, earnings from operations totaled $156,550, or 19 cents a share, and a gain realized from the sale of securities added $179,536, or 22 cents a share, for total net income of $336,086 or 41 cents a share.

As noted in our previous interim reports for the year, and as projected in last year's annual report, the principal factor influencing the year's earnings is the interest associated with our capital expansion program. Interest charges for the first nine months of the current year totaled $615,000, up about 60 percent over charges for the like period last year. We also have incurred significant additional expenses in conjunction with our geographical expansion into New York, Wisconsin and Iowa.

The geographical expansion, the addition of new customers and strong growth in our medical division are reflected in the increase in total revenues. And while every effort is being made to control costs — administrative expenses for the first nine months this year were lower than for the like period last year — we continue to assume expenses far greater than a single year's sales normally would warrant to complete our expansion program. The last of the four on-site air separation facilities constructed in our five-year $20,000,000 capital expansion program, the 1200-ton-per-day facility near Joliet, Illinois, is expected to be fully operational in March. It will double our capability to manufacture oxygen, nitrogen and argon.

While a substantial portion of the total potential output of the Joliet facility will be unsold initially, the plant's completion will assure that we will have production capability sufficient to handle far greater sales volume. The plant, because of its size and technological advances incorporated into it, can be expected to be our most efficient production unit.

Sales efforts have been directed at adding new customers, particularly in our expanded service area, in anticipation of the Joliet plant being operational. The end result is that we have incurred considerable cost in transporting liquid product, especially to the area west of Chicago. The new plant will alleviate this; with the plant near Joliet and our three other facilities, we will have sources of supply within easy delivery distance of all customers.

A development of significance was the recent sale of a Burdett designed and engineered rubber deflashing system consisting of two tumblers, controls and material handling equipment. Rubber deflashing is a process employed to remove excessive material from moulded rubber products. Nitrogen freezes the excess rubber, which becomes brittle, and which is then tumbled for removal. The Burdett deflashing system represents an important addition to our equipment line.

The Outlook

With just about a month remaining before fiscal 1970 is concluded, the outlook for the year appears very much as it was forecast. Sales and revenues will establish a new record. However, the costs associated with our expansion will severely penalize earnings, as evidenced by results for the first nine months. But, in fiscal 1971, we will have the contribution of the Joliet plant as well as a full year's operations of the Niagara Falls plant.

We expect to complete the acquisition of Precision Gas Products, Inc. within the next few weeks prior to the end of our fiscal year. It provides entry for us into the only industrial gas market in which we are not active, the formulation of highly refined ultra-pure gases used in cryogenics, air pollution control, electronics, chemical, petrochemical, aerospace and in biological research.

S. Michael Loveman

S. Michael Loveman
President and
Chief Executive Officer

February 10, 1970

A 4788

Mr P. Laister
Mr R. C. Hesketh-Jones

CX-234

30 April, 1970
JHW/MFJ

PRIVATE AND CONFIDENTIAL

P. J. Grant Esq.,
Lazard Brothers & Co. Limited,
11 Old Broad Street,
LONDON, E.C. 2

Dear Peter,

ZURBAIT OFFSHORE COMPANY

Thank you for your letter of 28 April and enclosed papers, and to confirm our conversation.

There is a possibility, albeit a small one, that BOC could be interested in this company. We know the Loveman family a bit and have had a number of conversations about this and that. But an essential pre-condition of our taking this question any further would be that BOC could obtain control, and a control which would be maintained however the convertible debentures were manipulated.

There are, of course, very many other questions which would need to be gone into, but it seems to us that this one is a prerequisite, and we would be interested to know whether Messrs Kuhn Loeb think that is something they can deliver.

Yours sincerely,

(J. H. Williams)

A 4789

CX-242

LAZARD BROTHERS & Co., LIMITED
(INCORPORATING EDWARD DE STEIN & CO.)

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TELEX GENERAL 28675
FOREIGN EXCHANGE 262378

G.P.O. BOX NO. 516

PJG/JA

2nd June, 1970.

PRIVATE AND CONFIDENTIAL

J. M. Williams, Esq.,
The British Oxygen Company Limited,
Hammersmith House,
London, W.6.

Dear John,

BURDETT OXYGEN

I have heard again from Kuhn Loeb to the effect that the state of Burdett is, as you surmised, considerably worse than that suggested by any figures published so far. There is considerable confusion surrounding the future of the Company and in these circumstances Kuhn Loeb are unable to deliver control as they hoped that they would be able to do.

I do not know if your interest in Burdett is sufficient to warrant taking any further action at the moment. Please let me know if you think it is. For the time being, I have asked Kuhn Loeb to bear your interest in mind as and when the situation clarifies.

Yours sincerely,